Australian Government
Department of Employment

Labour Market Research – Information Technology (IT) Professions

Australia December Quarter 2015

Research background

- This year's research on the IT labour market involved several components.
  - A phone survey of employers and recruitment agents who advertised for selected IT professional occupations between August and November 2015.[1] Both qualitative and quantitative data were collected.
  - A series of consultations with industry contacts and recruitment agents between September and December 2015 from which qualitative information was collected.
  - Collection of quantitative data from Commonwealth government departments on their experiences filling gazetted IT professional positions.

Key issues

- Despite a pick-up in demand for IT professionals over the last year, most employers were able to fill their vacancies, with 67 per cent of surveyed vacancies being filled.
  - That said, employers encountered some difficulty filling positions for senior ICT security specialists, senior web and front end developers, as well as senior analyst and developer programmers.
- A key feature of the IT labour market is the large number of candidates competing for available vacancies. There were, on average, around 29 applicants per surveyed vacancy and most employers were able to choose between multiple suitable applicants (an average of 3.1 per surveyed vacancy).
  - Notably, a number of employers recruiting for graduate or junior level vacancies had applicants who they considered to be overqualified for the advertised position.
  - Survey results and feedback from industry contacts indicate that employers are highly specific in their requirements. As a result, vacancies often remain unfilled despite attracting applicants who possess most of the relevant skills.
- The IT professional labour market is very large and, despite short-term volatility, employment growth for these professionals has been extremely robust over the long-term.
  - While difficult to quantify, the IT industry provides a large number of openings for graduates who have studied in the field of IT.

[1] For more information, see the Skill Shortage Methodology available on the Department of Employment website at https://docs.employment.gov.au/node/34245

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- However, it appears that IT university graduates are facing increasing difficulty securing employment in the IT sector. This has occurred despite university completions having been well below historical levels for a number of years, and the strong overall employment growth recorded in the sector in the past few years.
    - Full-time employment outcomes for IT graduates (67 per cent) were below average in 2015 (69 per cent) and are now significantly lower than they were in 2008 (84 per cent).[2]
    - The survey results suggest that graduate and junior positions are particularly competitive, with employers having an average of 5 suitable applicants to choose between for these positions.
- A number of trends have affected the IT labour market over recent years, including growth in the offshoring of IT functions. Industry contacts suggest that the offshored functions tend to be lower level, and more routine, which have, in particular, reduced the volume of entry level opportunities for graduates and juniors. In addition, there has been increasing reliance on the use of 457 visa holders by businesses.
- Employment growth for IT professions is expected to be robust over the five years to November 2020 (up by 36,900 or 14.9 per cent), compared with the average of 8.3 per cent across all occupations.

The labour market for IT professionals[3]

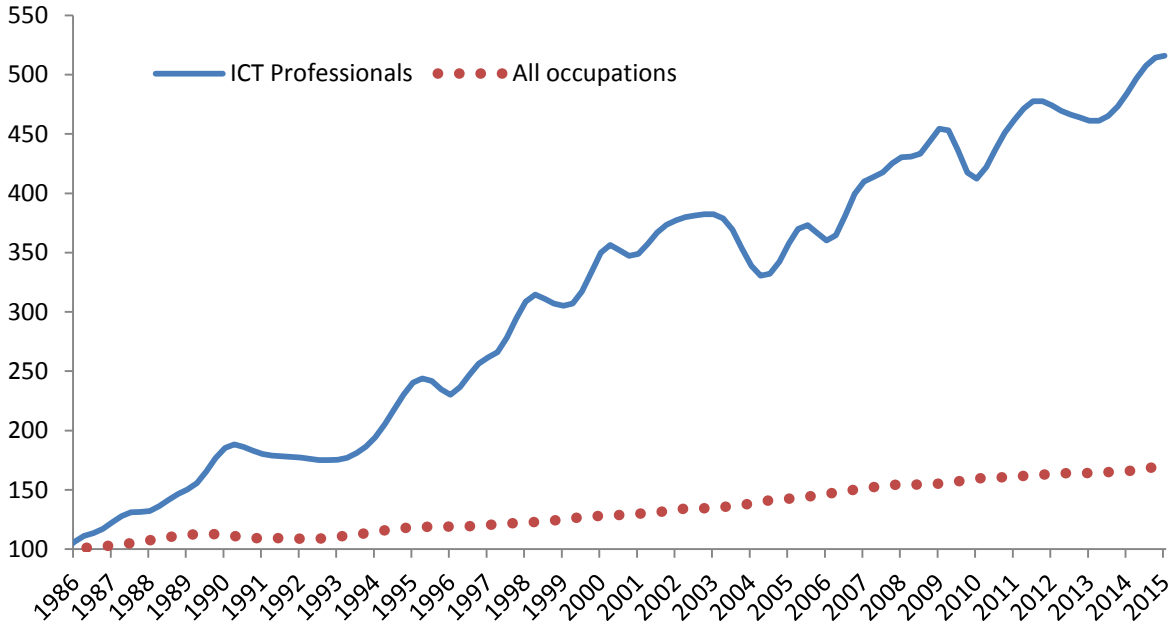
Broad, long-term trends in the IT labour market

- In Australia, the labour market for IT professionals is relatively large, with around 250,000 employed in the occupation in November 2015.[4]
- Notwithstanding some soft periods, employment growth of IT professionals has been strong over the last three decades (up by around 200,000 or more than 400 per cent, compared with growth of 70 per cent across all occupations).[5]
- The proportion of businesses that directly employ IT specialist staff has more than doubled, from 7.0 per cent in 2003-04, to 15.6 per cent in 2013-14.[6]
    - The greater use of IT professionals has been pervasive across industries, with almost all industries increasing the number of IT professionals employed relative to other workers over the last seven years (data are not readily available prior to this period).[7]
- Greater demand for IT professionals has been driven, at least in part, by information technology becoming increasingly integrated into the operations of businesses, and more businesses employing specialist information technology staff.
    - For example, the number of businesses receiving orders via the internet or web increased, from 12.0 per cent to 33.2 per cent in the 10 years to 2013-14. [8]

[2] Refers to students who studied in the field of computer science
[3] The term IT professionals in this section relates to the ANZSCO Sub-Major Group 26 ICT Professionals
[4] ABS, *Labour Force Survey*, November 2015, Department of Employment trend
[5] ABS, *Labour Force Survey*, November 2015, Department of Employment trend. Percentage change has been calculated for the time period between August 1986 (earliest readily available data) and November 2015.
[6] ABS, *Business Use of Information Technology*, 2003-04 & 2013-14
[7] ABS, *Labour Force Survey*, annual average, 2008 & 2015. Data prior to 2008 are not readily available.
[8] ABS, *Summary of IT Use and Innovation in Australian Business*, 2003-04 & 2013-14

- In more recent years, however, employment growth is likely to have been dampened by the trend towards offshoring IT functions.
    - Over the five years to 2014-15, the value of imported computer services rose by 10.5 per cent to almost $2 billion. That said, growth over the last year was considerably slower, up by 1.0 per cent.[9]
        - The category of 'computer services' imports includes hardware and software consultancies and data processing services.
    - It is important to note, though, that the value of Australia's exports of computer services (at $1.85 billion) is almost commensurate with imported computer services, but it has grown at a slower rate over the last five years (up by 6.5 per cent). [10]
    - In the Clicks IT survey of businesses, 25 per cent of respondents stated that some of their IT functions were currently offshored. The survey also found that the "rapid growth in the offshoring of IT functions experienced over the last five years appears to have slowed".[11]

Chart 1: Indexed employment growth, ICT professional and all occupations, 1986 to 2015



Source: ABS Labour Force Survey, November 2015, indexed (August 1986 = 100)

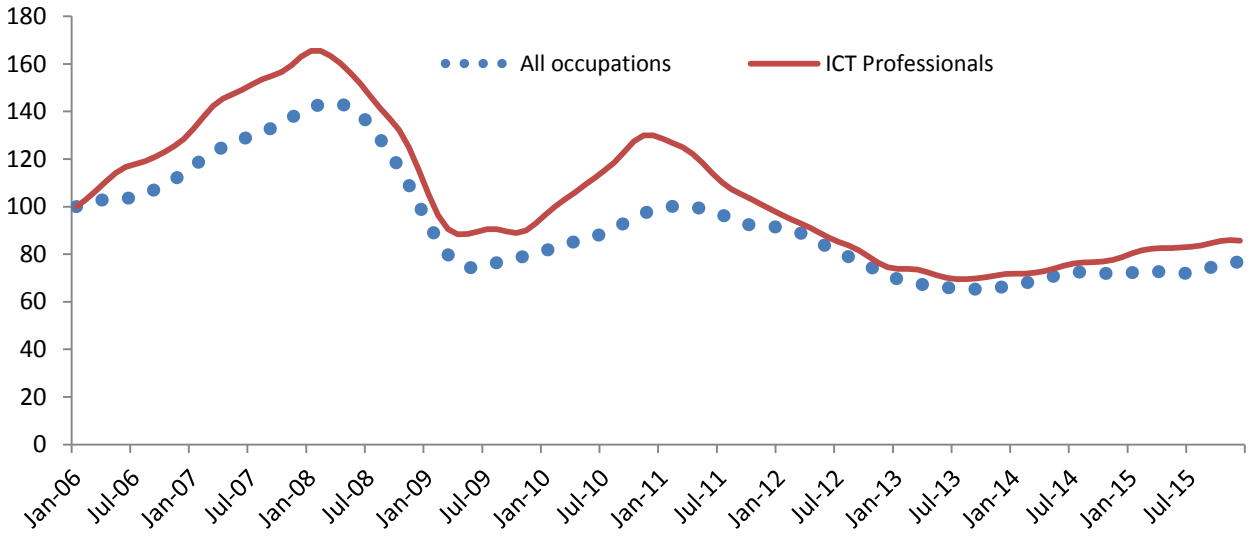
More recent developments in the IT labour market[12]

- The labour market for IT professionals was subdued between late 2012 and mid 2014.
    - During this period, there were hiring freezes in the public sector and widespread consolidations of government budgets (at all levels of government), and the overall employment growth rate for Australia[13] was below trend.

[9] DFAT, *Trade in Services Australia*, 2014-15, refers to the five year trend figure
[10] Ibid
[11] Clicks IT Recruitment, *IT Recruitment and Retention Report*, 2016
[12] The term IT professionals in this section relates to the ANZSCO Sub-Major Group 26 ICT Professionals
[13] ABS, *Labour Force Survey*, trend

- From late 2014 through to late 2015, however, the IT labour market has strengthened, with employment growing by a robust 6.5 per cent over the year to November 2015, more than double the average for all occupations.
    - The number of internet job advertisements for IT professionals is currently around its highest level since mid-2012. Despite this recovery, however, advertisements remain low compared with historical levels.[14]

Chart 2: Internet Vacancy Index, January 2006 to December 2015 (indexed)



Source: Department of Employment, Internet Vacancy Index, December 2015, trend, (January 2006 = 100)

    - The recent Clicks IT *Job Seekers Report* found that there has been a "definite strengthening in the employment market for IT professionals" and that fewer respondents had been seeking work for three months or longer (31 per cent), down from 42 per cent the previous year.[15]
    - ITCRA SkillsMatch data indicate that the average number of days to fill a vacancy has been trending up since 2013, possibly indicating increased difficulty finding staff.[16]
    - The 2015-16 Greythorn *Job Seeker Market Report*, found that IT professionals were slightly more optimistic than in the previous year and that the number of IT professionals actively looking for work has decreased significantly when compared with past years.[17]

Training pathways into the IT professions

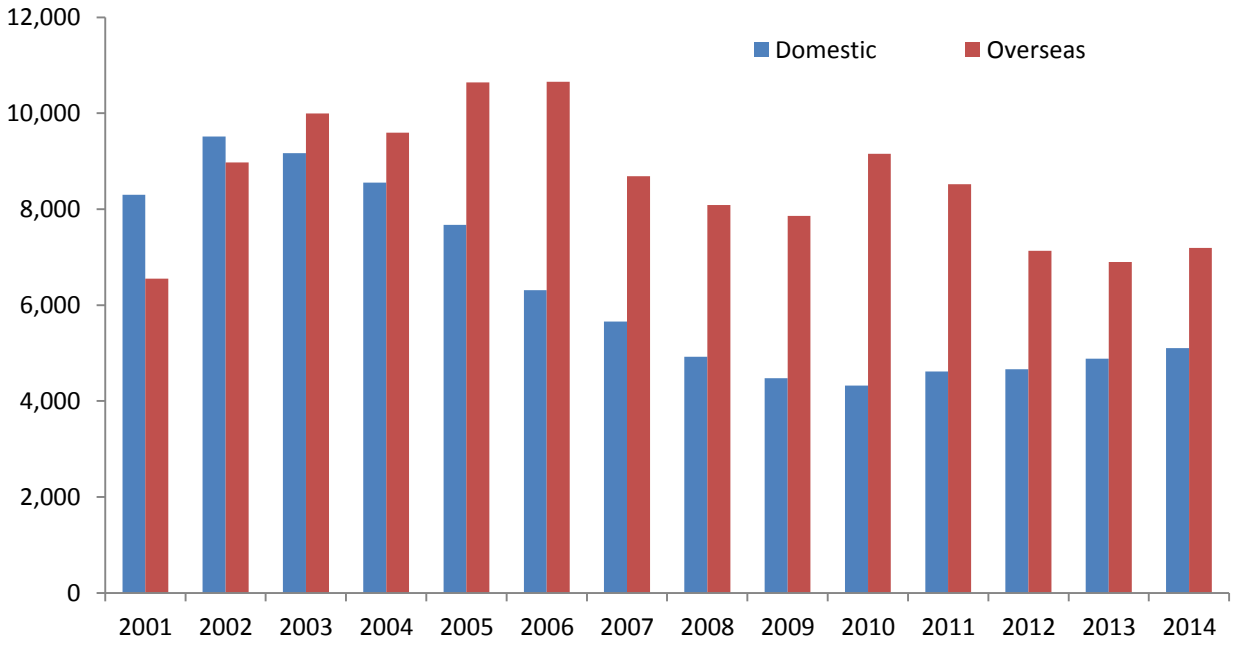
- Training pathways into the IT professions include university courses, industry certifications, vocational qualifications, and self-training.
    - People employed as IT professionals are most likely to be university educated. For instance, in 2015, 71 per cent held a bachelor degree or higher.[18]
    - Vocational qualifications appear to be a less frequent pathway into IT professions, with only 13 per cent having a certificate III or higher vocational qualification as their highest level of study.
    - Around 12 per cent of IT professionals did not hold a vocational or university qualification.[19]

[14] Department of Employment, *Internet Vacancy Index*, December 2015, trend
[15] Clicks IT Recruitment, *IT Job Seekers Report*, 2016
[16] Information Technology Contract and Recruitment Association (ITCRA), *ICT Employment Trends Report*, Q4, 2015
[17] Greythorn, *Australian Technology Recruitment: Job seekers market report*, 2015-16
[18] ABS, Education and Work, May 2015. Data refer to the ANZSCO Sub-Major Group 26 ICT Professionals.

The labour market for IT graduates

- In 2014, around 12,000 students graduated from a university course at Australian institutions in the field of IT (latest available data). Around 60 per cent were overseas students.[20]
    - Overseas graduates from an Australian university can contribute to the labour supply for the IT labour market temporarily, including through the temporary graduate or post-study work stream visa. There are also other temporary visa options for international student graduates.
    - Subject to meeting eligibility criteria, these graduates may qualify for permanent or temporary skilled migration, as there are a number of information technology related occupations on the Skilled Occupation List (SOL) and the Consolidated Sponsored Occupation List (CSOL). [21]
- While the number of domestic students completing university studies[22] in Information Technology has increased for four consecutive years (up by 18 per cent since 2010) to around 5100 in 2014, it remains well below levels recorded in the early 2000s.
- In 2014, there were around 7200 overseas students completing university courses in Information Technology. After declining for three consecutive years, the number of overseas graduates increased in 2014, by around 4 per cent. Overseas student completions remain well below the peak levels recorded in 2005 and 2006 (of over 10,000).[23]

Chart 3: Number of students, by citizenship, graduating in the field of Information Technology 2001 to 2014



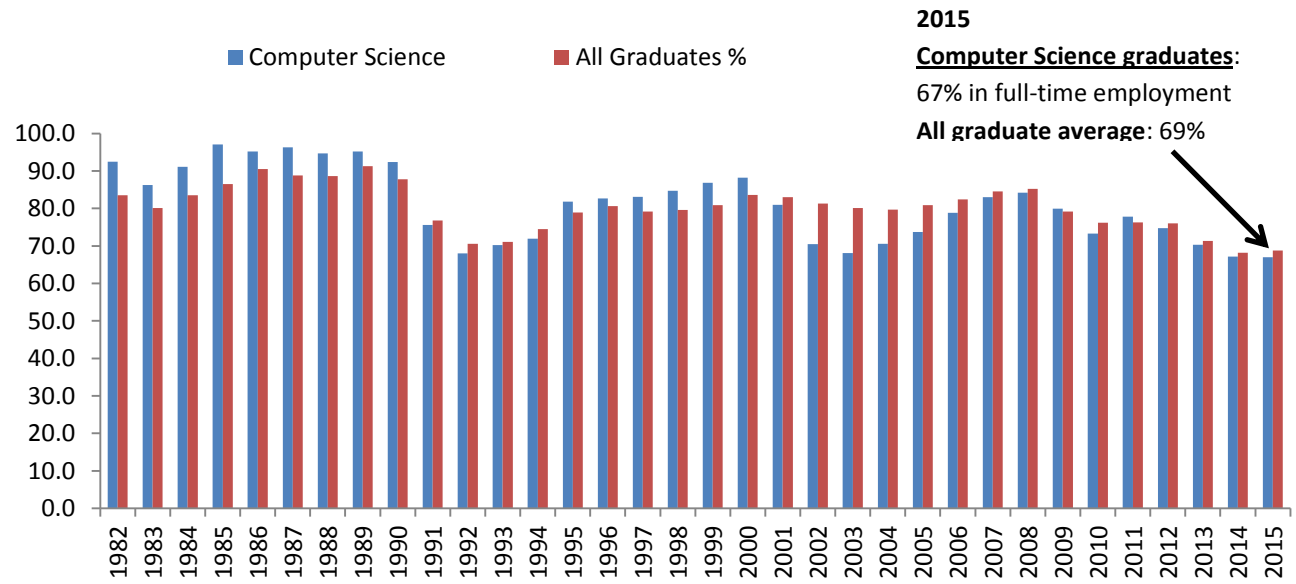
Source: Department of Education and Training - Higher Education Statistics Data Cube (uCube)

- Automation, increased outsourcing of entry level type tasks and functions, and cloud computing is likely to have slowed the growth in the number of job openings for graduates.
    - The itnews Graduate Guide for 2015/2016 noted that "IT outsourcing and cloud computing have resulted in a surplus of IT professionals on the market."

[19] ABS, Education and Work, May 2015. Data refer to the ANZSCO Sub-Major Group 26 ICT Professionals.
[20] Department of Education and Training, *Higher Education Statistics Ucube*
[21] There are, though, a range of other criteria that need to be met to be eligible for general skilled migration
[22] Includes undergraduate, postgraduate students as well as a small number of enabling courses
[23] Department of Education and Training, *Higher Education Statistics Ucube*

- In this context, it is important to note that despite a large decline in the number of students studying in the field of Information Technology over the last two decades or so, there does not appear to be a shortage of graduates.
- A range of data suggests that there is some spare capacity in the graduate labour market at present. Notably, graduate outcomes for students studying in the field of Computer Science (which includes the vast majority of students studying in the Information Technology field of education) have been declining for four consecutive years.[24]
    - In 2015, 67 per cent of computer science graduates were in full-time employment four months after graduation, below the average of 69 per cent for all graduates. Graduate outcomes are now 17 percentage points below the level recorded in 2008 (84 per cent).
    - Of those computer science graduates who found full-time employment, around 70 per cent were employed as an IT professional.[25]
    - In the Department's survey, about 40 per cent of employers advertising for graduate or junior positions specifically noted that they also received applications from candidates who they considered to be overqualified, although most were found to be unsuitable for the position.[26]
- A survey by Clicks IT found that only 26 per cent of employers had hired graduates in the last 12 months, the lowest level in more than ten years.[27]
- On a positive note, the strong employment growth projected for IT professionals over the next five years may improve the employment prospects of IT graduates going forward.

Chart 4: Proportion of Computer Science graduates and all graduates in full-time employment four months after graduating, 1982 to 2015



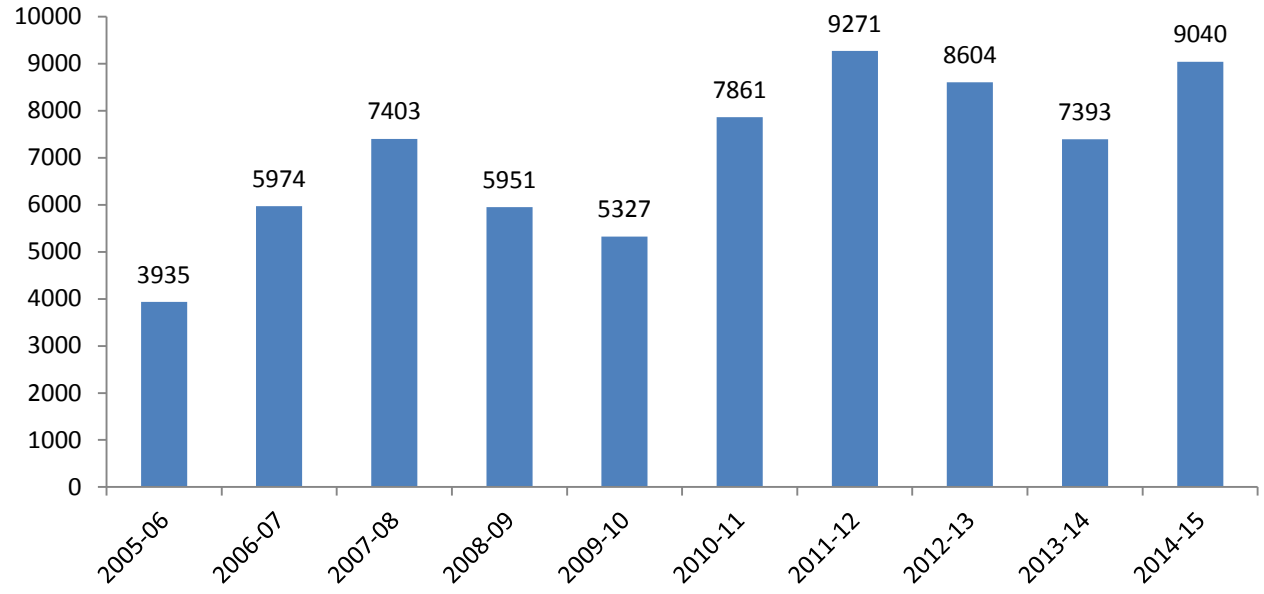
Source: Graduate Careers Australia, Graduate Destinations 2014 Tables and Figures, Gradstats 2015

[24] Graduate Careers Australia, *Graduate Destinations 2014 Tables and Figures, Gradstats,* 2015
[25] Refers to anyone who was employed in the ANZSCO Sub-Major Group 26 ICT Professionals
[26] Department of Employment, *Survey of Employers who Recently Advertised* for IT professionals 2015
[27] Clicks IT Recruitment, *IT Recruitment and Retention Report*, 2016

Migrant supply to the IT professional labour market[28]

- While it is difficult to obtain consistent data on the overall contribution of the migration programme to the IT labour market, 457 visas (a temporary skilled visa) are a key source of supply.[29] In this highly specialised labour market, 457 visas are an important mechanism for employers to access niche skill sets that might not be available in the local labour market.
  - In 2015, there was an average of around 10,400 IT professionals on a 457 visa.
  - The number of 457 visas granted for IT professionals rose strongly over the year to 2014-15 (up by 1650, or 22 per cent, to around 9000), following two consecutive annual declines in grant numbers.
    - While 457 visa grant numbers for IT professionals are variable over time, grants have been generally trending upwards since 2005-06 (when the data series began).
  - The number of IT professional 457 visa holders is increasing at a faster rate than the number of employed IT professionals. In 2009-10, the number of 457 visa holders equated to 3.0 per cent of employed IT professionals, but by 2014-15 it had risen to 4.3 per cent.[30]

Chart 5: 457 visa grants, IT professionals, 2005-06 to 2014-15



Source: Department of Immigration and Border Protection (DIBP), Subclass 457 visas granted pivot table, primary visa holders only

[28] IT professionals in this section refers to the ANZSCO Sub-Major Group 26 ICT Professionals

[29] DIBP, Temporary Work (Skilled) visa (subclass 457) Programme: Subclass 457 visa holders pivot table & Subclass 457 visas granted pivot table, four quarter average

[30] ABS, *Labour Force Survey*, 4 quarter average & DIBP, Temporary Work (Skilled) visa (subclass 457) Programme: Subclass 457 visa holders pivot table

Feedback from industry stakeholders

In late 2015, the Department undertook a series of consultations with industry associations, peak bodies and large recruitment agencies which specialised in the recruitment of IT professionals. This was to complement the information gathered through the Survey of Employers who Recently Advertised and to provide additional insights on the recruitment experiences of employers (many of whom may not use formal recruitment methods to fill their vacancies for IT professionals).

- Overall, the consultations indicated that demand for IT professionals was strengthening. Contacts cited rising demand in Sydney and, to a lesser extent, Melbourne but this was offset by weakness in Queensland and, more significantly, in Perth. Contacts said that vacancies in the ACT market are generally difficult to fill and that there has been a recent increase in demand for contractors.
- While almost all contacts highlighted specific areas where they felt there were shortages of skilled candidates, there was no clear consensus about the specific occupations or skills that were in shortage. Almost all participants identified that, within this labour market, areas of oversupply co-exist with areas of shortage. The most commonly mentioned occupations recruitment agencies had difficulty filling were SAP developers, cyber security specialists, SCCM deployment, mobile developers, and Sharepoint specialists. It was commonly noted by contacts that large projects with competitive remuneration could quickly "soak up" available candidates, leading to a rapid decline in the available supply.
- The emerging areas of demand most commonly mentioned were data scientists, data miners, cyber security, as well as cloud computing and infrastructure specialists.
- The most commonly identified areas of oversupply were business analysts, project managers and test analysts with more generic skills. It was noted the oversupply of testers was linked to the trend of offshoring of testing jobs.
- A key theme emerging from the consultations was that employers are becoming increasingly specific in their list of candidate requirements and that vacancies often remain unfilled despite recruitment agents having candidates who possess most of the desired skills. Another consistently raised issue was the difficulty filling vacancies that required a security clearance. This was largely due to losing quality candidates as a result of the lengthy clearance process.
- The importance of soft skills was frequently emphasised and candidates lacking interpersonal or communication skills (such as having poor spoken English) will have difficulty being placed.
- A few contacts indicated that contract arrangements are the norm in the IT industry (often due to the very technical and/or finite project based nature of many roles) and that, for many candidates, this is an ideal arrangement. It was emphasised that informal recruitment methods (such as headhunting and referrals) are used heavily by businesses seeking to fill IT professional vacancies. It was also noted that there is a trend towards contracting organisations to deliver whole solutions, instead of undertaking the work in-house.

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- While many employers require candidates to have a bachelor degree (or higher), the discussions indicated that university qualifications are not as important as they once were. Contacts repeatedly emphasised that experience and skills, in most instances, are the priority rather than university qualifications. A university degree, however, was important for candidates who are at the start of their career. That said, it was mentioned that vendor certifications were highly sought after in some instances and anecdotal evidence indicated that some students were choosing these over university degrees, although there are no data available on the extent to which this is occurring.[31]
- Contacts said that most recruitment agents would not place, or would have difficulty placing, a recent graduate as businesses tend to undertake graduate recruitment in-house. They mentioned that IT help desk technicians roles were a potential pathway for graduates having difficulty entering the profession directly, and that Sydney and Melbourne offer the most opportunities for graduates seeking to break into this market. That said, some employers recruit more on talent demonstrated, for example, through strong performances in online competitions, and a portfolio of high quality or innovative self-directed work.

Australian Public Service

- Data from some ongoing and non-ongoing recruitment rounds for IT professionals in the Australian Public Service (over the second half of 2015) were also collected. Most of the recruitment rounds identified a suitable candidate who accepted the role (85 per cent)[32]. There were, on average, 9.5 applicants per vacancy. The number of suitable candidates per vacancy stood at an average of 1.6 per vacancy.[33]
    - It should be noted, however, that a number of agencies surveyed had undertaken limited recruitment of IT professionals over this period, due likely to hiring freezes only being unwound toward the end of 2015.
    - Greythorn has reported that the federal government market is improving as projects ramp up. Despite this, Greythorn notes that contract rates are expected to remain flat over the coming 12 months.[34]

[31] A vendor certification is provided by a product vendor qualifying holders in specific elements of the product. An example of this would be a CISCO certification.

[32] Importantly, this does not mean the vacancy was filled as some successful candidates may not have subsequently passed the relevant security clearance required for the role

[33] Due to the different reporting from recruitment systems in APS agencies, the population for the proportion of vacancies filled and the number of applicants and suitable applicants is not consistent

[34] Greythorn, *Australian Technology Recruitment: Market insights & Salary Guide, Australian Government (Federal and State)*, 2015-2016

Results from the *Survey of Employers who Recently Advertised*

See the Summary Results by Occupation section for details on the selected IT professions surveyed

Chart 5: Proportion of surveyed IT professional vacancies that were filled, and average number of applicants and suitable applicants per vacancy

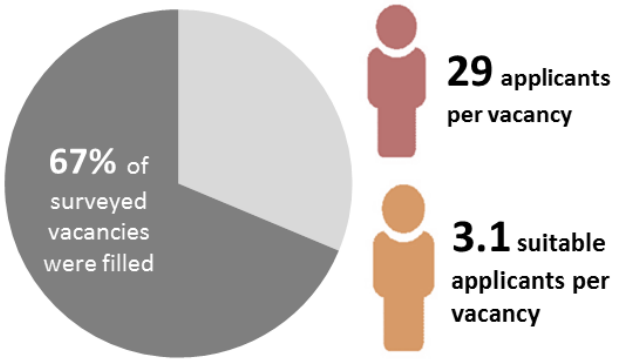


Chart 6: Proportion of vacancies filled, by level of seniority

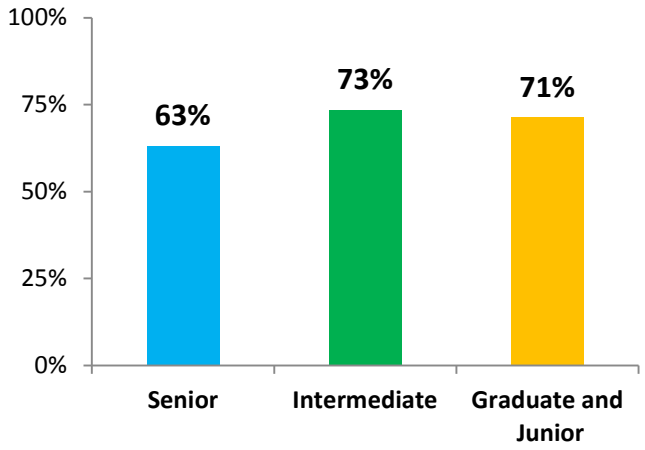
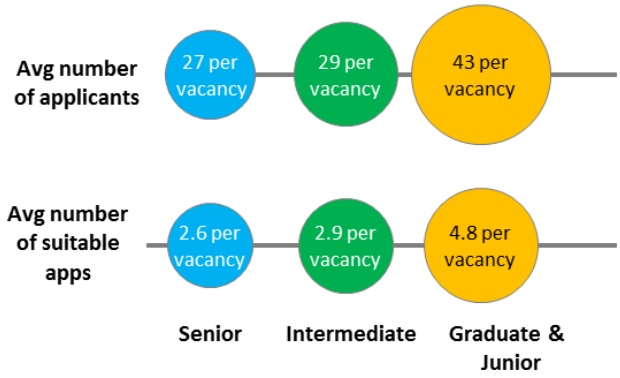


Chart 7: Applicant competition, by level of seniority of vacancy



Most employers were able to recruit a suitable applicant for their IT professional vacancy, with 67 per cent of vacancies filled.

The survey results showed large numbers of job seekers competing for available vacancies.

- There were, on average, 29 applicants per vacancy and employers were generally able to choose between multiple suitable applicants (3.1 suitable applicants per vacancy, on average).

Most vacancies surveyed were either at the senior or intermediate level. Relatively few employers surveyed were seeking to fill junior or graduate vacancies.

There was some variation in employers' ability to fill vacancies, depending on the level of seniority required for the vacancy.

- Senior vacancies were the most difficult to fill (63 per cent were filled), compared with 73 per cent of intermediate vacancies.

While more than a quarter of junior or graduate vacancies remained unfilled, analysis of these vacancies indicates that employers are very particular when filling these positions.

- Many of these employers attracted applicants who could have filled the positions, but did not consider them as they were "overqualified", or were unable to agree on wages.

Regardless of level, however, employers still (on average) attracted relatively large candidate fields.

- Intermediate and senior vacancies both attracted more than 25 candidates and around three suitable applicants per vacancy, on average.
- Competition for graduate or junior vacancies was the strongest (employers had an average of around 5 suitable applicants to choose between).

Senior vacancies were the most likely to be filled via 'head-hunting' the successful candidate. These employers were also the most likely to comment that candidates had unrealistic expectations of salaries. A number of employers said that 'headhunting' for a suitable candidate, was necessary to fill high-demand roles

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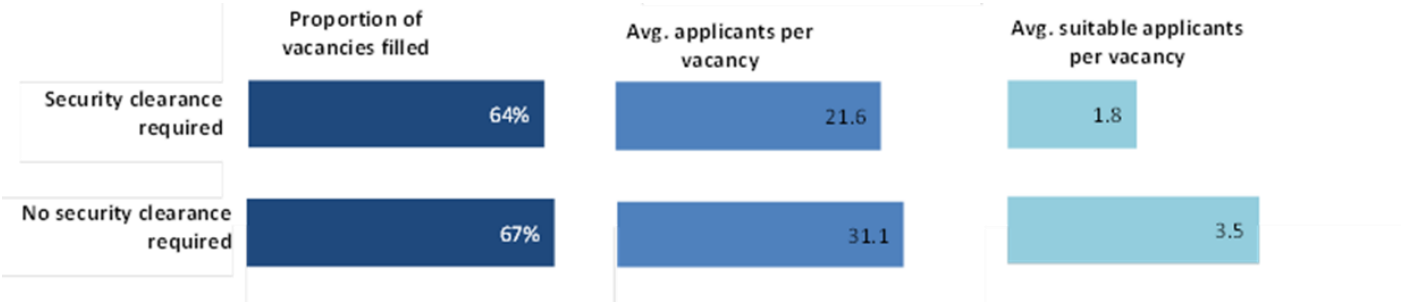
Security clearances

- Security clearances appear to be a barrier to filling some roles. Positions requiring a security clearance attract considerably fewer candidates and had a slightly lower proportion of vacancies filled.
    - Industry contacts emphasised the additional challenges in filling roles requiring security clearances. Many noted that the long timeframes involved in obtaining a security clearance discourage candidates and that many quality applicants find other employment while the clearance is being processed.

Chart 8: Proportion of vacancies filled, average applicant and suitable numbers per vacancy, by whether a security clearance was required or not



- Of those employers with an unfilled vacancy, more than half were recruiting for a senior vacancy (55 per cent) and 21 per cent noted that the vacancy was either a specialised or niche position.
    - In addition, comments from employers suggest wages can have a significant impact on the ability of an employer to fill their vacancies. Around 20 per cent of employers with an unfilled vacancy noted that they either attracted a suitable applicant but couldn't agree on wages or that the wages they were able to offer were not competitive enough to attract a quality field on that occasion.
- Sectors where vacancies were slightly more likely to be unfilled were
    - IT services (including IT consulting, designing and developing software and networks)
    - the financial, banking and insurance sectors
    - government.

Reasons applicants were unsuitable

- Unsuitable applicants typically lacked the technical skills required, experience in the employer's industry or the necessary years of experience in similar roles. Industry contacts, as well as employer comments, indicate that a lack of soft skills, particularly communications skills, is also a common reason for applicant unsuitability.
- It was also relatively common for employers to note that they had overqualified applicants applying for graduate and junior positions. These candidates were generally not considered for the position as employers felt they would soon seek other opportunities. Other reasons for candidates being considered unsuitable include:
    - not holding a mandatory security clearance
    - failing coding or knowledge tests
    - an inability to provide portfolios that met employer requirements.

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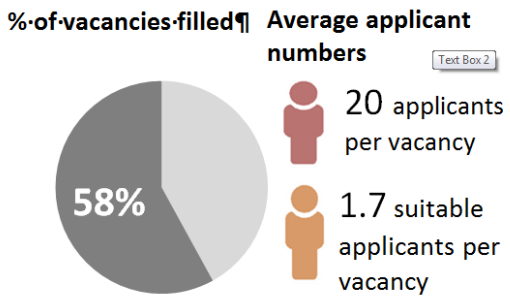
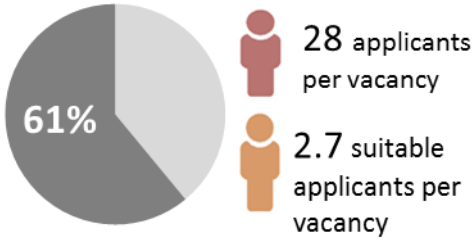
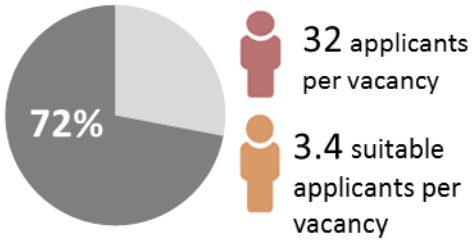
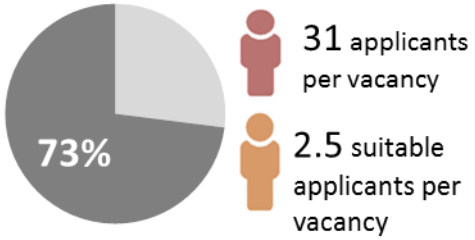
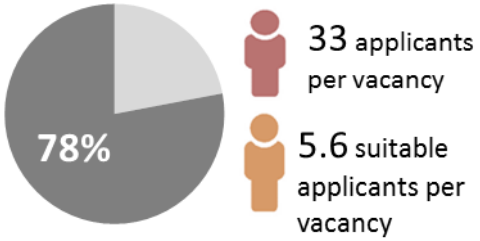
Summary results by occupation

	**Occupation:** *ICT Security Specialist* **Rating:** Recruitment difficulty for positions at the senior level Very few surveyed vacancies were below the senior level. Of the occupations surveyed, ICT Security Specialists were the most difficult to recruit for, attracting the lowest average number of applicants and suitable applicants per vacancy.
	**Occupation**: *Developer Programmer and Analyst Programmer* **Rating**: Recruitment difficulty for positions at the senior level Employers typically required applicants to be skilled in a wide variety of programming languages, applications or frameworks. Recruitment difficulty appears to be concentrated in senior and/or specialist positions, with most intermediate level positions being filled (71%), compared with 55% of senior level vacancies.
	**Occupation**: *Web Developers (inc.Front End Developers)* **Rating**: Recruitment difficulty for positions at the senior level Employers sought candidates with a wide and diverse range of skills. Employers generally filled intermediate level vacancies with ease (81% were filled) and received large fields of applicants and suitable applicants (an average of 4.2 per vacancy). Senior vacancies, however, were much more likely to remain unfilled (53% were filled) and relatively few applicants were considered suitable (an average of 1.6 per vacancy).
	**Occupation**: *Software Tester, ICT Quality Assurance Engineer, ICT Systems Test Engineer* **Rating**: Unable to rate due to limited numbers of employer contacts The majority of surveyed employers were able to fill their vacancies and received large numbers of applicants. Industry contacts noted that there was an oversupply of testers in some locations, and this labour market had been affected by the outsourcing some testing functions overseas.
	**Occupation**: *Systems Administrators, ICT Support Engineers, Computer Network Professionals* **Rating:** Unable to rate due to the limited number of employer contacts Overall, employers recruiting for these occupations filled more than three quarters of the surveyed vacancies and employers were usually able to choose between multiple suitable applicants. A particularly high proportion of employers surveyed for these occupations considered applicants to be unsuitable due to poor communication skills.

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