

The IT Skills Deficit – an Opportunity for Industry and Educators

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ABSTRACT

Information technology is an enabling technology that affects the entire NZ economy. A failure to meet demand for IT professionals could have severe repercussions in terms of competitiveness and economic growth. Research indicates that over the next few years there will be a major international shortage of IT professionals. This paper investigates the evolving international reduction in workers entering formal tertiary level training in Information Technology, and its parallels appearing in the NZ market. This paper also suggests ways in which the NZ IT industry could reduce this demand by co-operation with tertiary providers and marketing the IT profession as a desirable career option.

Keywords

Skills shortage, information technology education, employment strategies

1. INTRODUCTION

A loss of confidence in IT investment since the “tech wreck” / dot.com crash and reduced upgrading of systems since Y2K has seen a reduction in demand for IT skills. This, coupled with low unemployment and high tertiary fees, has impacted the tertiary education sector in New Zealand over the last few years. There is also evidence from a literature review that some of these same issues have resulted in declining enrolments internationally (Sloan, 2004).

In 2004 the number of students applying to study IT at university in the UK fell 11.8% over 2003 (Goodwin, 2004), and this appears to be a global trend. Applications in Australia for university high-technology places is reported to have “dropped by 50 percent Australia-wide in the last two years” (Anon, 2004). Employers are failing to attract school leavers and graduates. In New Zealand in 2004 there was a 20% drop in

students graduating with ICT degrees (Puller-Strecker, 2005).

The objectives of this paper were to conduct a literature review to determine:

- How widespread are declining enrolments in IT tertiary education?
- Establish whether an IT skills shortage is evident, or predicted in New Zealand and also internationally.
- Discuss ways of reducing an IT Skills deficit by reference to methods used in the past, and any propose any new methods.

2. THE DEVELOPING SKILLS SHORTAGE

In 2005 a worldwide shortage of IT skills is developing. India is predicted to face a shortage of IT professionals of 262,000 by 2012 (Computerworld, 2004), and in Australia it is reported that IT skills shortages are now starting to impact government projects (Bajkowski, 2005). Gartner have predicted in the United States that by 2012 there will be 21 million new jobs in IT but only 17 million IT workers ready to meet this demand based (Barlas, 2005).

In the UK, Forrester Research has warned that “UK and mainland Europe should brace itself over the next 12 months for the biggest ‘war of talent’ for IT staff since the 1990’s” (Vowler, 2005, p.26).

From a New Zealand and international perspective, confidence is returning to the sector and projects are now struggling to find suitably qualified staff. The future is bright, in that there



are compelling arguments to pursue IT careers (and qualifications). Unfortunately the cyclical nature of the situation means that tertiary providers are currently in a situation of high employment and low numbers of prospective students who identify IT as a viable career.

IT skills are listed as a key short term and long term skills area by New Zealand Immigration, however it is clear that New Zealand is just one of many countries that have identified this shortage.

A press release from the Department of Labour indicates that “vacancies on two IT websites increased by 49% over the April 2004 and April 2005 years” (Scoop, 2005).

Given high employment and high student loans, Government may also need to look at creative ways of encouraging study in Information Technology if New Zealand is to stem direct impacts on competitiveness and economic growth.

Although New Zealand is also hoping to attract more New Zealanders home to fill skills shortages, as well as encourage immigration from people with IT skills, New Zealand now finds itself in international competition for skilled IT workers.

Methodologies for calculating the cost of the shortage are difficult to describe. We can calculate the cost of the loss of income to the tertiary education sector by calculating the reduction in enrolments. The cost however of a shortage on the ability for NZ businesses to resource projects is problematic. Some projects may not be able to start, and some may not complete. Many factors such as increased costs in maintaining legacy systems, lost competitiveness, and so on may have major impacts. These impacts will be felt not just by technology companies. Most of the approximately 10 million IT workers in the US are not employed by technology businesses. According to Dunne (2004), “92 per cent work in other businesses reliant on computers to maintain their competitiveness and lower their costs” (p.24). We can assume that this percentage is similar for New Zealand.

3. WHAT WAS DONE BEFORE?

With the development of serious, worldwide shortages in IT skills established, it remains to ask “What can we do about it”? We will now examine a number of approaches used by academia, industry and governments during the Y2K boom years.

In the period of 1999 to mid 2001 there were major shortages created by the high number of IT projects underway. This was a time of relative prosperity in global economic growth and many countries had low unemployment and buoyant economies. In many ways this is analogous to the situation emerging today. So what methods were attempted during the boom to rectify the local problem of IT skill scarcity? These may be typified into a simple Build or Buy decision – training schemes to rapidly create a more skilled workforce, and schemes to bring in more labour from other sources or retain the workers currently in the system.

3.1 BUILDING THE SKILLS BASE

Training it seems was considered the panacea cure to skills gaps, though there was no consistent approach. The quick fix was meant to be the emergence of web based training (Wilson, 2001), though this had little reported impact then, and is not used to great effect today. There were recurring themes in the solutions using improved linkages with schools to promote the IT career choice, a growing dissatisfaction with short skills training courses for those without a broader base of skills, and growing recognition of retraining to support career switching and the re-integration of older IT professionals. This last aspect deserves a little more explanation.

Encouraging career changes proved a useful way to bring in mature and useful staff with existing market knowledge and soft skills. Mateyaschuk (1999) reports that specific skills training is often all that is required, and recommends certificate and undergraduate training. Mateyaschuk also states that “Recruiters estimate that 5% to 10% of technology people come from entirely unrelated careers” (p.110) so even while unemployment is low, IT can remain a career option to recruit into from other fields.

The other fields recruited from do not have to be professional, as one British initiative took on long-term young homeless people. After some soft skills development, technical training and sensitive management, they were productively dealing with recycling PCs (McCurry, 2001). Many roles in the industry do not require career oriented, highly skilled people. Neil (1999) and Raths (1999) identified typical underused labour sources in people with disabilities, minorities, rural workers, and women.

In order to support the introduction of workplace specific training needs internships (or equivalent) became popular, at one time reported in 82% of the 400 companies surveyed (Kosan, 2000). In boom times intern candidates became harder to find, but they still created a base for future full time staff and represented a good saving in recruitment costs. Similar links to summer employment, scholarships and relationships with undergraduates were seen as useful, and all obtained for a small salary, some benefits or even just academic credits.

Collaboration between academia, government and industry feature in a number of initiatives with a longer term focus of aligning the training and education available to industry needs. Activities supported included such things as sabbaticals for academics into industry so they can tell the real story to the students about what the industry needs, industry representatives serving in an advisory capacity to boards and providing career advice (Raths, 1999).

Industry and government bodies have even collaborated to promote IT careers at a regional level for a long term solution to their staffing, recognising that they waste a lot of time and money raiding each other's staff pools (ibid.).

The emerging message is that collaboration that sets the expectations for IT careers needs to be done much earlier than years 11-13 in the secondary school system (Leach and Zepke 2005).

4. BUYING IN SKILLS

Several countries (including USA, England and Canada) increased work visas as a measure to attract staff. In 2000 in the USA the increase from 65,000 to 115,000 did little to dent the 400,000 positions that remained open (Neil, 1999). The

major companies generally made little use of this labour pool, and the smaller companies used this source for quick skills boost and strategic capability development projects. These workers were generally lower paid by some 30% and more expensive to support (Livingston, 2001). Even with the apparent success of these programmes the general drive to educate the local market was a strong social goal, for example USA visa fees cross subsidised a scholarship fund for low income students (Neil, 1999). Other benefits of the foreign workers included recognising the cultural depth and quality added to products developed for international markets.

The message appears to be if your country is an attractive working destination you may benefit from additional visas during boom times, but what if this isn't the case? Some speculate that the expert labour pool of the emerging IT nations are no longer readily available to attract overseas, those countries will be experiencing a labour shortage themselves. Bringing in foreign labour did little to help in 2001 and may not help now.

In terms of luring people to roles there were typically rapid increases in salary according to widely varying examples and depending on expertise and local demand. Unfortunately this was seldom seen as encouraging longer term relationships and retention schemes with perks, share options, work variety, mentoring and socialisation proved more successful in reducing the turnover (Zemke, 2000). Retention of your staff (sometimes using retention bonuses) became more economic than the desperate scramble to attract new staff from a diminishing labour pool. Of course the actions of the industry over the years that created the expectation that staff must change employers frequently or be regarded as stale and under motivated, did little to encourage retention and this created significant problems for smaller employers who could not offer different roles within their company. Referral programmes that offered cars and cash rewards for finding and recommending new employees, were seen as much more effective than advertising, brought in many quality staff, and rewarded the current staff for their support. Some companies even advertised vacancies on billboards and buses in their efforts to get the attention of a competitive

market (Howle, 1999).

A few tax credit or development havens were proposed and implemented with some success, however there was no apparent linkage reported to gaining better recruitment, they just tended to be able to retain more IT workers in a local community.

5. CONCLUSION

For business – for the short term be prepared to defer/delay projects, consider alternative sources of labour for low level short term requirements, use your staff contacts to recruit, and make more effort to retain staff. Consider an internship or scholarship programme. For the medium and long term you need to be involved in promoting IT careers, and improve the alignment between your needs and training/education providers. The preferred training mix appears to be broad base with specialisation and some industry qualifications. Polytechnics have traditionally addressed this need.

For education - gear up to support skills top-ups and career switching to support short term needs, and re-examine the profile of your graduates – does it include communications and soft skills as well as specific technical skills?

For governments – protect your labour force from erosion and encourage specialist work visas. Consider tax breaks to attract labour and development efforts. Consider the reducing student loan costs for students undertaking study in key skills shortage areas.

In summary, there appears to be a wide variety of techniques available to weather the serious skill shortages looming. None will guarantee success. While we only develop the labour market in times of high demand, and only use already skilled labour in times of surfeit, a boom-bust cycle will be inevitable. What is needed is long range anticipation of the workforce skill needs, promotion of IT careers and well aligned training to deliver the skills when they are needed.

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