

# Women and Computing Careers in Australia

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## INTRODUCTION

In spite of predictions that the spread of information technology (IT) would help break down the gender segregation that characterized employment in the industrial era, women are under-represented in professional computing occupations throughout the advanced industrialized world, and those who do take up work in the IT sector are most likely to be found in routine and comparatively low paid jobs. The emergence of a “lighter, cleaner, and more sedentary set of occupations than the technologies of iron, oil and steam” (Cockburn, 1985, p.2) has certainly produced new jobs for both women and men, but—as Cockburn argues—gender inequalities have been reshaped rather than eradicated in this process of technological change.

The aim of this article is to extend existing knowledge about gendered employment patterns in professional computing with an examination of the situation in Australia in the early 21<sup>st</sup> century. Drawing on research conducted as part of a project funded by the Australian Research Council (Whitehouse, Hunter, Smith, & Preston, 2002-5), the analysis illustrates the types of computing jobs that women are most likely to enter, and the extent to which women are ascending career ladders to take up senior technical and/or management positions. While this is primarily a descriptive exercise, it produces a more nuanced picture of gender inequalities in IT employment than observations simply about under-representation, and allows some reflection on strategies to enhance opportunities for women.

## BACKGROUND

Feminist analyses have long drawn attention to the “historical and cultural construction of technology as masculine” (Wajcman, 1991, p. 22), with a wide range of studies examining the processes that underpin the reproduction of gender inequalities in IT-

related employment. At one end of the spectrum, attention has been paid to the way gender differences are developed in the recreational use of computer technology, as well as in the “educational pipeline” (see, among many, Greenhill, von Hellens, Neilsen, & Pringle, 1996; Henwood, 2000; Margolis & Fisher, 2002). Within the workplace itself, analysis has focused on issues such as masculine cultures and sexual harassment, gender-biased notions of skill, lack of informal networks and role models for women, and demands for skills currency and working-time pressures that restrict the ability to balance work and family (for example, Ahuja, 2002; Webster, 2004; Wright, 1996). Clearly, not all these phenomena are peculiar to IT employment, and within the IT sector there are also contrary propositions, such as an expectation that new IT firms may be less constrained by traditionally gendered culture and practice (see Panteli, Stack, Atkinson, & Ramsay, 1999), and recognition that the technology itself brings potential to maximize time and space flexibilities.

It is not the goal of this article to adjudicate between competing explanations or ascertain the compounding causes of gender differences in IT employment; rather the purpose is to provide additional detail on the shape of gender differences within the IT workforce. Much analytical attention has been focused at the level of occupational choice, with the problem identified broadly as women’s under-representation in IT courses and employment. Here, the focus is on patterns within the labor market. In particular, the aim is to illustrate the *horizontal segregation* of men and women across IT occupational categories, as well as *vertical segregation* between status levels within these occupational categories (see definitions at the end of the article). While a global picture of segregation can be identified (for example, with processor assembly work performed largely by women in poor countries), this article is limited to the Australian case and high-skill (or ‘professional’) computing jobs.

## **AN AUSTRALIAN OVERVIEW**

The material presented below draws on aggregate level survey data to illustrate patterns of segregation in IT employment in Australia. Although a deeper understanding of the development and reproduction of gender inequality requires additional dimensions such as qualitative investigation of workplace culture and practice, it is only survey data that can provide the overview sought in this analysis. The first sub-section outlines the data used, noting its strengths and limitations. The second and third sub-sections address, respectively, patterns of horizontal and vertical segregation. While there is no attempt to establish causal relationships, the implications of the statistical overview are considered briefly in the final sections of the article.

### **Data**

Data are drawn primarily from a commissioned survey of large IT firms operating in Australia (*Survey of Employment and Pay Rates by Gender in the IT Industry*) conducted by Classified Salary Information services (CSi) in November-December 2003. The intent was to produce a gender breakdown of employment and pay rates in a selection of skilled roles relating to the development, configuration and maintenance of computer systems, and for this purpose CSi utilized its comprehensive and regularly updated list of occupational roles and position descriptions in the IT sector. Responses were received from 77 of the 108 companies contacted, and this delivered information on 12,706 employees working in 106 designated occupational roles. The sample cannot be taken as representative of IT employment or computing professionals as a whole, because it only includes information on full-time employees and long-term contractors within the respondent organizations (although these comprise the majority of employees in all cases), and it excludes small IT firms and organizations in which IT is not the primary function. However, the data do provide a relatively comprehensive picture of regular employment in large IT companies in Australia, with an important advantage being the fine level of occupational detail available.

Additionally, data are drawn from the Australian Bureau of Statistics (ABS) 2001 Census of Popula-

tion and Housing. This provides a useful backdrop for the CSi data, with the main advantage of the census being the statistically reliable picture it provides of the Australian population. However, the standard occupational classification system used in the census lacks the finely detailed categorization of IT jobs in the CSi survey, hence observations from the census are limited to the 4-digit occupational category “Computer Professionals” and some of its constituent sub-groups.

### **Horizontal Segregation**

In Australia, as elsewhere, there is marked horizontal sex segregation within IT-related employment at a broadly inclusive level (that is, where IT employment is defined as ranging from occupations involving routine use of computers, to the design of IT systems and software). For example, data from the 2001 Australian census show that while women made up only 23% of computer professionals at that time, they were over-represented in lower paid areas of IT-related work such as data entry, where they accounted for 85% of employees. As would be expected, a more homogeneous picture was evident *within* the category “computer professionals”, although the census data do indicate some variation among the sub-categories, with women more likely to be “systems managers” (close to 30% of this group was female) than “systems designers” (around 18% female).

The degree of variation observed is clearly dependent on the level of occupational definition; thus horizontal segregation is more apparent within the comprehensive list of computing jobs covered in the *Survey of Employment and Pay Rates by Gender in the IT Industry*. Women accounted for 22% of employees covered in this sample, which—as noted earlier—includes skilled jobs associated with the design and maintenance of computer systems, but excludes jobs based solely on the routine use of computers such as data entry. While this overall percentage of women is similar to the figure for computer professionals in the census data, within the occupational roles included, female share varied from under 10% for a range of support engineer roles to over 60% of employees in areas such as technical writing.

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