



**GODBE RESEARCH**  
Gain Insight

COMPUTER SOFTWARE  
INDUSTRY CLUSTER

Labor Market Survey 2004

Conducted for the Orange County Workforce Investment  
Board

January 2005

## TABLE OF CONTENTS

---

List of Figures .....	ii
List of Tables .....	iii
Introduction .....	4
Executive Summary .....	5
Computer Software: Industry Analysis.....	8
Computer Software: Occupational Analysis.....	16
Computer Software: Occupational Wages .....	22
Computer Software: Education and Skill Occupational Assessment .....	26
Appendix A: Methodology .....	32
Appendix B: Survey Questionnaire.....	37

## LIST OF FIGURES

---

Figure 1 Hiring practices for Non Entry-Level Positions .....	9
Figure 2 Frequency of Recruiting Outside of Orange County .....	10
Figure 3 Frequency of Recruiting Outside of Southern California .....	11
Figure 4 Difficulties in Recruitment and Retention .....	12
Figure 5 Outsourcing in Orange County .....	13
Figure 6 Type of Outsourcing (n = 8) .....	13
Figure 7 Location of Outsourcing (n = 7) .....	14
Figure 8 Employee Development Practices .....	14
Figure 9 Use of GIS Technology .....	15
Figure 10 Difficulty Finding Employees with GIS Skills (n = 5) .....	15
Figure 11 Mean Difficulty Finding Qualified Applicants .....	18
Figure 12 Mean Frequency of Hiring Outside of Orange County .....	19
Figure 13 Mean Frequency of Hiring Part-Time Employees .....	20
Figure 14 Mean Frequency of Hiring Temporary Employees .....	21
Figure 15 Interpreting a Boxplot Diagram .....	24
Figure 16 Distribution of Entry-Level (Low) Annual Wages .....	25
Figure 17 Distribution of Experienced (High) Annual Wages .....	25
Figure 18 Mean Typical Education Requirements .....	26
Figure 19 Occupation Skill Assessments: Software Engineers .....	27
Figure 20 Occupation Skill Assessments: Software Programmers .....	28
Figure 21 Occupation Skill Assessments: Systems and Database Administrators .....	28
Figure 22 Occupation Skill Assessments: Customer Support Specialists .....	29
Figure 23 Occupation Skill Assessments: Project Managers .....	29
Figure 24 Occupation Skill Assessments: Technical Writers .....	30
Figure 25 Occupation Skill Assessments: Inspectors, Testers, and Quality Assurance Auditors .....	30
Figure 26 Occupation Skill Assessments: Network Systems Administrators .....	31
Figure 27 Occupation Skill Assessments: Sales Representatives .....	31
Figure 28 Example of a Boxplot Diagram .....	36

## LIST OF TABLES

---

Table 1 Summary of Survey Methodology .....	5
Table 2 Industry Employment Practices.....	8
Table 3 Occupational Retention and Turnover Over the Next 12 Months .....	17
Table 4 Annual Wages for Entry-Level (Low) and Experienced (High) Employees by Occupation .....	23
Table 5 Summary of Survey Methodology .....	32
Table 6 Occupation Descriptions .....	33
Table 7 Margin of Error .....	34
Table 8 Means Questions and Corresponding Scales .....	35

## INTRODUCTION

---

Godbe Research & Analysis (Godbe Research) is pleased to present the results of a labor market study conducted for the Orange County Workforce Investment Board. This particular report will focus on the Computer Software (COMP) cluster, which includes firms that publish software, provide custom computer programming and system design services, and Internet service providers. This report is organized into the following sections:

- The *Executive Summary* includes a summary of the *Key Findings* from the survey, a short description of the survey methodology as well as conclusions and recommendations for the Computer Software cluster based on our research.
- The *Summary of Findings* section offers a question-by-question analysis of the survey. The discussion is organized into the following sections:
  - Computer Software: Industry Analysis on page 5
  - Computer Software: Occupational Analysis on page 16
  - Computer Software: Education and Skill Occupational Assessment by Occupation on page 26
- *Appendix A* includes a complete description of the methods and procedures used to conduct this research.
- *Appendix B* provides the survey questionnaire.

## EXECUTIVE SUMMARY

---

### Introduction

In July 2004, the Orange County Workforce Investment Board hired Godbe Research to conduct three industry cluster studies focusing on key industry sectors identified in *Orange County Workforce 2004: Where Do We Fit in a Global Marketplace*. The three industry clusters included: Biomedical, Business and Professional Services, and Computer Software. Each study included a quantitative survey component that gathered detailed information about the area's industries, firms, and occupations.

This particular report focuses on the Computer Software cluster, which includes firms that publish software, provide custom computer programming and system design services, and Internet service providers.

### Survey Methodology

Table 1 briefly outlines the methodology used in this project. Using a database compiled from InfoUSA and Inside Prospects, firms with at least five employees in the Computer Software cluster were called to complete either a phone survey interview or an Internet survey (n = 100), representing a total of 1,528 Computer Software firms in Orange County. Interviews were conducted from August 26 through September 22, 2004 and each interview typically lasted 20 to 30 minutes.

Table 1 Summary of Survey Methodology

<b>Technique</b>	Telephone Interviewing and Internet Survey
<b>Universe</b>	Firms from the Computer Software cluster located in Orange County with at least five employees
<b>Field Dates</b>	August 26 - September 22
<b>Interview Length</b>	20-30 minutes
<b>Sample Size</b>	100 Computer Software firms

Sample size was driven by the goal to interview as many firms in the Computer Software cluster as was possible. For COMP, the margin for error was at  $\pm 9.48\%$ . Because the number of firms employing individuals in each of the Computer Software occupations was lower than the overall number of firms in the sample, the occupational data is less reliable than the data for the industry analysis.

For a more detailed description of the methodology please see Appendix A.

## Research Findings

Based on a narrow range of industries specifically related to computer software manufacturing and administration, the Computer Software (COMP) cluster serves as an excellent measure of the County's growth in high technology employment. Indeed, some research has shown that a large reduction in high technology jobs is generally indicative of a contraction in the macro economy, whereas large expansions in the high technology sector are reflective of even a moderate growth rate in the macro economy. Matching growth projections from California's Employment Development Department (EDD), results of the survey do, in fact, reveal strong growth expectations for the cluster and, by extension, the entire County.

Overall job growth for this industry is expected to increase by eleven percent with even stronger growth prospects found in specific occupations.

A brief profile of the Computer Software cluster in Orange County, include the following salient characteristics:

- A substantial percentage of employees (94%) in the Computer Software cluster worked in full-time positions and only a slight percentage (2%) were employed on a temporary basis.
- A majority of firms (52%) reported that they more often hire from outside the company to fill non entry-level positions, nearly twice the number of firms that more often promote from within (27%).
- About a third of Computer Software firms either "Always" (12%) or "Frequently" (20%) recruit individuals from outside of Orange County; however, these recruiting patterns are not repeated when looking at the Southern California region. None of the companies indicated that they "Always" recruit outside of the region and only six percent said that they "Frequently" recruit outside of Southern California.
- The most important workforce issues facing the industry related to recruiting. In particular, two-thirds of COMP firms expected to face at least some difficulty in recruiting non entry-level employees and another 52 percent may have at least some difficulty in recruiting entry-level employees. Furthermore, 59 percent indicated that they foresee some or great difficulty in recruiting employees with reasonable salary requirements.
- Among the three industry clusters tested in the study (Business Services, Biomedical industry, and Computer Software), the Computer Software industry had the lowest instances of offering career development programs or career ladders (32%) and tuition assistance at a college of university (28%).

Although growth expectations were strong across all of the occupations tested in the survey, ranging from six percent to 21 percent, two particular occupational groups stand out for the strong opportunities employers expect they will provide to the local workforce.

- **Software Engineers and Programmers:** Both Software Engineers and Software programmers had the highest typical educational requirements among the occupations tested in the survey. In addition, employers also saw technical competence as vital to these positions. Both occupations will have high demand in the coming year. For example, both have robust growth projections (14% and 15%, respectively) and firms reported a high turnover rate (24%) among Software Programmers. Importantly, both occupations rank high in mean wages for inexperienced and experienced workers. Lastly, 56 percent of firms indicated that they have some or great difficulty in finding applicants for these occupations who meet the companies' hiring standards.

- **Sales Representatives and Inspectors, Testers, and Quality Assurance Auditors:** In contrast to the Software Engineers and Programmers, these two occupations do not typically require high levels education; however, similar to the software developers, both of these occupations are expected to have high demand in the next 12 months. In particular, both occupations have high projected growth rates (20% and 21%, respectively) as well as modest turnover rates in the coming year (Sales Representatives: 12%; Inspectors, Testers, and Quality Assurance Auditors: 15%). Because of the lower educational and training requirements, Sales Representatives and Inspectors, Testers, and Quality Assurance Auditors ranked in the lower third for average salaries among inexperienced workers in the COMP industry (although experienced Sales Representatives had the second highest average wage among experienced employees). A majority of Computer Software companies (54%) expected some (34%) or great (20%) difficulty finding qualified Sales Representatives and another 65 percent expected some (60%) or great (5%) difficulty finding qualified Inspectors, Testers, and Quality Assurance Auditors.

## Conclusions and Recommendations

With its high growth potential, relatively high wages, and future prospects in the statewide economy, the Computer Software cluster represents a golden opportunity for the local workforce. To nurture the continued growth of this cluster, the OCWIB should look into the following:

- **Improve Connections between Employers and Prospective Employees in the County:** Survey results have shown that nearly a third of all Computer Software companies either always or frequently recruit individuals outside of the County and another 28 percent that sometimes recruit outside of the County. Increasing the linkages between prospective candidates and employers can be attained by improving the relationship between career counselors at local community colleges and universities and their human resources counterparts at area Computer Software firms. This particular relationship is especially important, given the technical expertise that is required of most of the occupations in this cluster.
- **Assist Local Computer Software Firms in Building Career Development Programs:** A nexus of trends uncovered in the study point to this particular workforce need. First, high projected demand through optimistic growth projections and relatively high turnover rates will make it difficult for firms to rely solely on recruitment to fill positions. Secondly, few firms in the industry currently use career ladders or provide tuition assistance to their employees. Lastly, only about a fourth of COMP firms promote from within to fill non entry-level positions, while nearly two-thirds of COMP firms predict at least some difficulty filling these same positions in the next few years. Therefore, the Computer Software industry may face a shortage in experienced employees in crucial occupations. To address these workforce needs, the OCWIB can work with local firms to provide career development programs as well as encourage further employee training at local colleges and universities.

## COMPUTER SOFTWARE: INDUSTRY ANALYSIS

The first five questions of the survey asked respondents about the nature of their workforce. In particular, respondents were asked how many permanent full- and part-time employees worked at their business location, how many of them were temporary or seasonal workers, and what they believed would be their expected growth in the next 12 months. In addition, respondents were asked to estimate the percentage of their current employees that plan to retire in the next three years.

- Q1. How many permanent full-time employees work at your business location?
- Q2. How many permanent part-time employees work from your business location?
- Q3. How many temporary and/or seasonal employees currently work at your business location?
- Q4. Including all full-time and part-time employees, how many **permanent** employees do you expect to have 12 months from now?
- Q5. How many temporary and/or seasonal employees do you expect to have 12 months from now?
- Q9. In the next 3 years, what percentage of your current employees do you expect will retire?

As shown by Table 2, 94 percent of the Computer Software employees worked full-time and only six percent worked part-time. Less than two percent of employees in this cluster were employed in temporary positions. In the next year, COMP firms projected an increase of 1,609 employees in Orange County, representing a robust 11 percent growth rate. The projected growth rate for the Computer Software industry (11%) was higher than the projected growth rates for the other clusters tested in this study. Two percent of COMP employees were expected to retire within the next three years, opening up an additional 309 potential positions.

Table 2 Industry Employment Practices

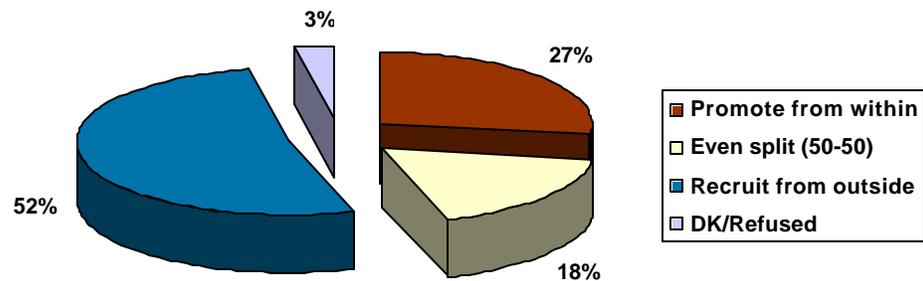
	Total Employees	Full-Time Employees	Part-Time Employees	Temporary Employees	Expected Growth in Employment Over 12 Months	Expected Retirement in Next 3 Years
<b>COMP</b>	14,611 1%	13,717 94%	894 6%	279 2%	1,609 11%	309 2%

Next, respondents were asked a series of questions pertaining to their hiring practices. Specifically, Question 6 asked respondents about their hiring practices for non entry-level positions.

Q6. When a non entry-level position becomes available in your firm, do you more often hire from outside or promote from within the company?

As shown by Figure 1, 52 percent of Computer Software firms reported that they recruit candidates from outside of the firm, whereas 27 percent indicated that they recruit internally in order to fill non entry-level positions. Eighteen percent reported an even split between recruiting from outside of the company and promoting from within. Three percent of respondents either did not know or declined to reveal their hiring practices.

Figure 1 Hiring practices for Non Entry-Level Positions



Businesses were then asked about the frequency in which they recruit candidates from outside of Orange County and Southern California respectively.

Q7. How often does your business recruit individuals from outside the County but within the Southern California region for employment?

Q8. How often does your business recruit individuals from outside Southern California for employment?

A third (32%) of Orange County Computer Software firms either “Always” (12%) or “Frequently” (20%) recruit candidates from outside of the County. Twenty-eight percent of firms “Sometimes” recruit outside the County, while 39 percent reported that they “Rarely” (25%) or “Never” (14%) recruit individuals from outside of Orange County. One percent chose not to respond to this question.

Figure 2 Frequency of Recruiting Outside of Orange County

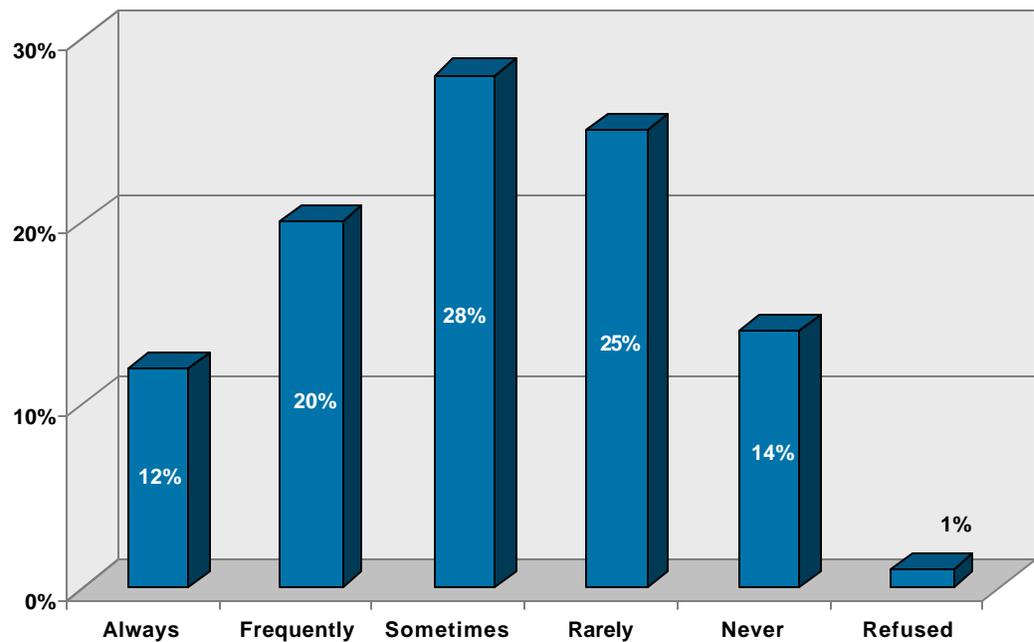
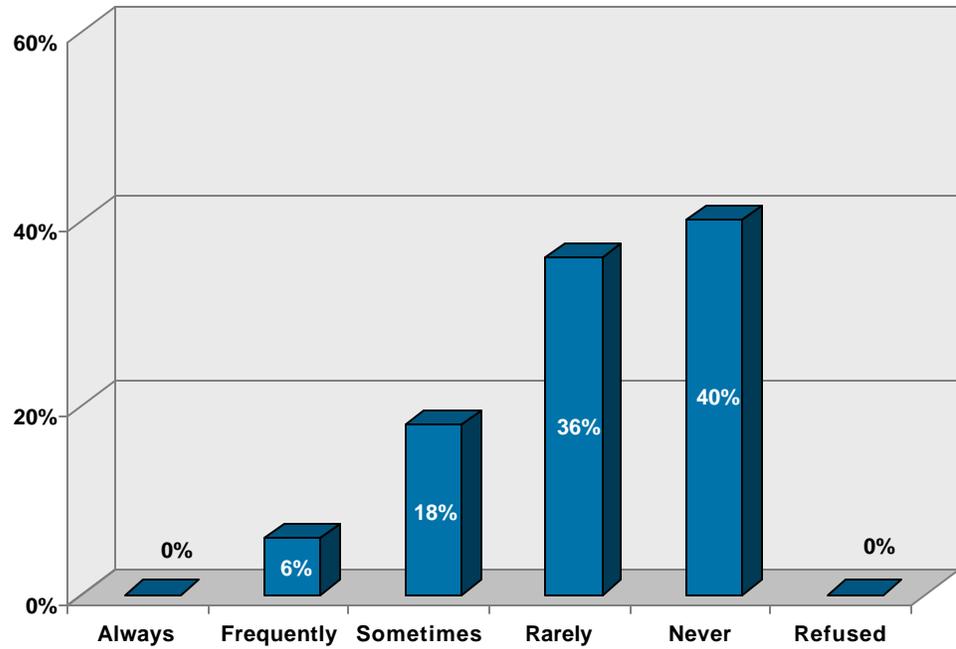


Figure 3 shows that the Southern California region can usually supply Computer Software firms with quality applicants. Forty percent of firms reported that they “Never” recruit candidates from outside of Southern California and another 36 percent “Rarely” go outside of the region. Eighteen percent “Sometimes” go outside the region to hire new employees, whereas only six percent of businesses “Frequently” recruit individuals who live outside of Southern California. None of the companies surveyed indicated that they “Always” recruit individuals from outside of Southern California.

Figure 3 Frequency of Recruiting Outside of Southern California



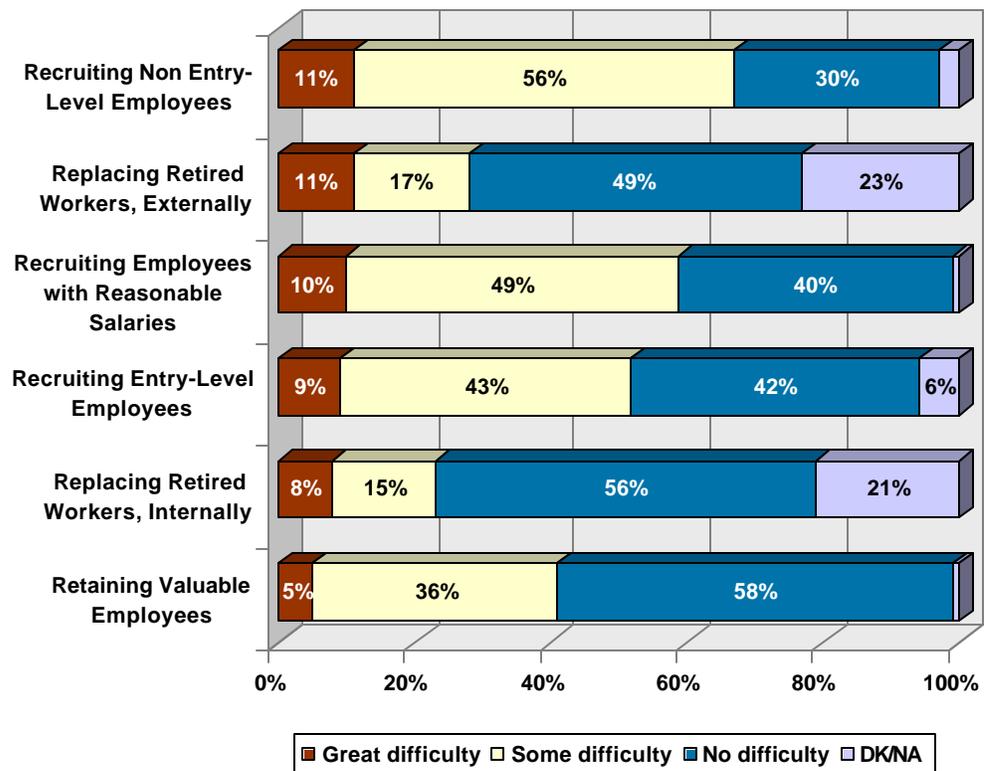
Question 10 asked respondents to anticipate the level of difficulty their businesses face in addressing a series of workforce issues related to recruitment and retention of employees in the next few years.

Q10. Next, I'm going to read a list of issues facing the region's workforce in the coming years. Please tell me how much difficulty your firm faces in addressing these workforce needs.

Here's the (first/next) one: \_\_\_\_\_. Please tell me whether your business has no difficulty, some difficulty, or great difficulty in dealing with this issue.

On the whole, firms in the Computer Software cluster did not report great difficulty with the recruitment and retention issues tested in the survey. In particular, only 11 percent of firms anticipated great difficulty "Recruiting non entry-level employees with adequate skills and experience;" however, 56 percent did indicate that they could have "Some difficulty" in the coming years. Respondents also foresaw at least some difficulty "Recruiting employees with reasonable salary requirements" (59% great or some difficulty) and "Recruiting entry-level employees with adequate training and education" (52% great or some difficulty). On the other hand, 58 percent of firms reported no difficulty in "Developing strategies to retain valuable employees" and 56 percent saw no difficulty in "Replacing retired workers with qualified candidates from outside the firm."

Figure 4 Difficulties in Recruitment and Retention



The next set of questions asked respondents various questions pertaining to outsourcing, the process where companies move a division of their business to another location.

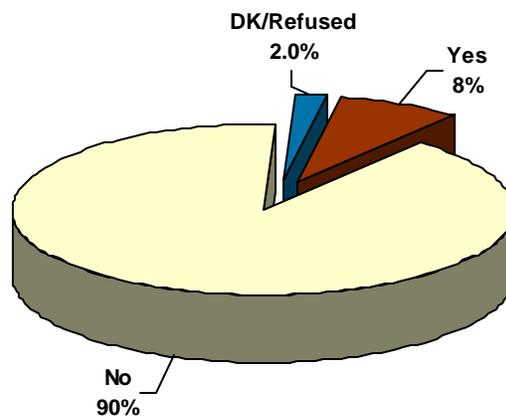
Q11. During the past two years, has your company relocated any of its business processes, including production and services, to a lower cost location outside of Orange County?

Q12. Which type of business process did your company relocate outside of the County? Did your company move its production or manufacturing processes, its services, or both?

Q13. Where did your company relocate to outside of the County?

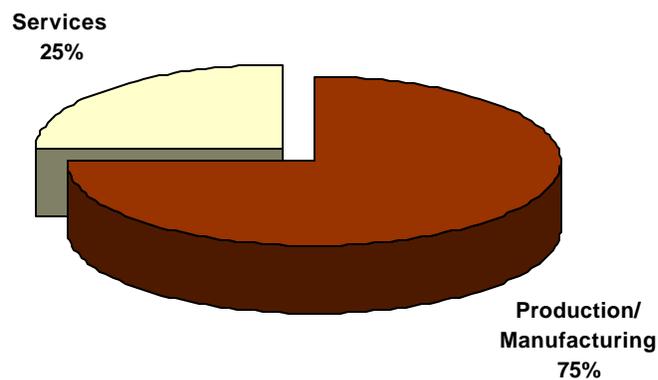
Approximately eight percent of Orange County Computer Software firms have outsourced some part of their business processes to a location outside of the County during the past two years. Ninety percent of COMP companies have not relocated their business processes outside of the County. Two percent declined to answer this question.

Figure 5 Outsourcing in Orange County



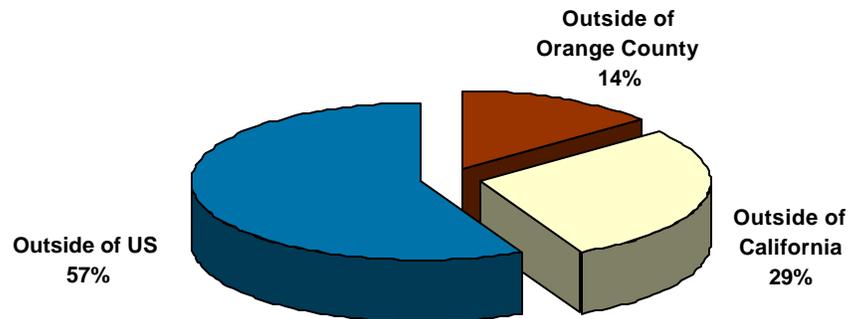
Of the eight companies that reported that they outsource some part of their business, six reported that they outsourced divisions relating to “Production or manufacturing” and two outsourced their “Services.”

Figure 6 Type of Outsourcing (n = 8)



Four out of seven companies reported that they relocated a part of their businesses outside of the United States, two moved outside of California, and one moved divisions outside of the County.

Figure 7 Location of Outsourcing (n = 7)

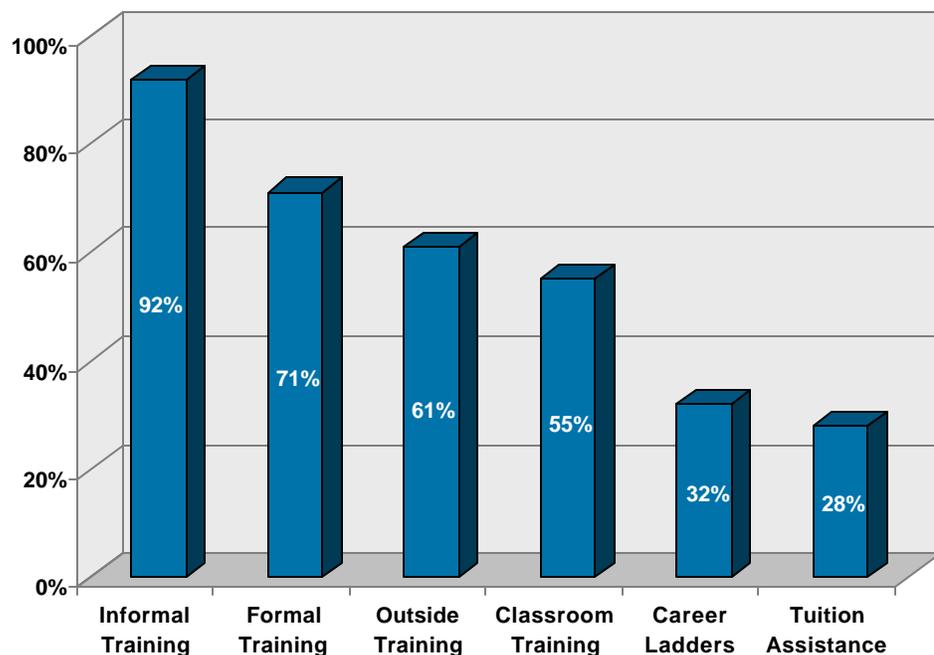


In order to identify areas where the Orange County Workforce Investment Board can assist businesses with employee development programs, Question 14 asked respondents to indicate which training programs they currently use.

Q14. Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

Most firms in the Computer Software cluster rely on “Informal on-the-job training” (92%) to develop their employees, followed by “Formal on-the-job training” (71%), “Employer-Paid outside training” (61%), and “In-House classroom training” (55%). Relatively few COMP firms reported offering “Career Development/Career Ladders” (32%) or “Tuition assistance at a college or university” (28%) for their employees.

Figure 8 Employee Development Practices

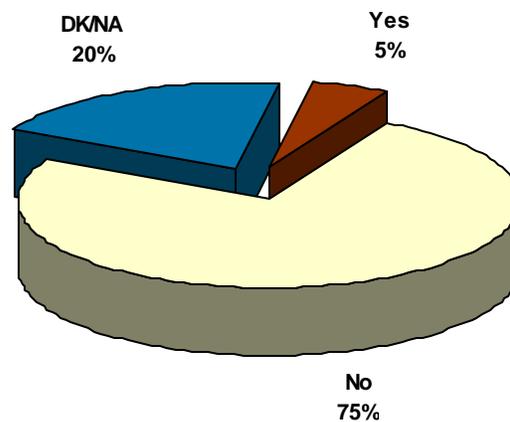


Questions 15 and 16 were designed to assess the need for GIS or geospatial technology training programs.

Q15. Does your firm use or have GIS or geospatial technology?  
Q16. (IF YES TO Q15, ASK): Has your firm had any difficulty hiring or finding employees internally with GIS or geospatial technology skills? (IF YES) Is that some difficulty or great difficulty hiring or finding employees internally with GIS skills?

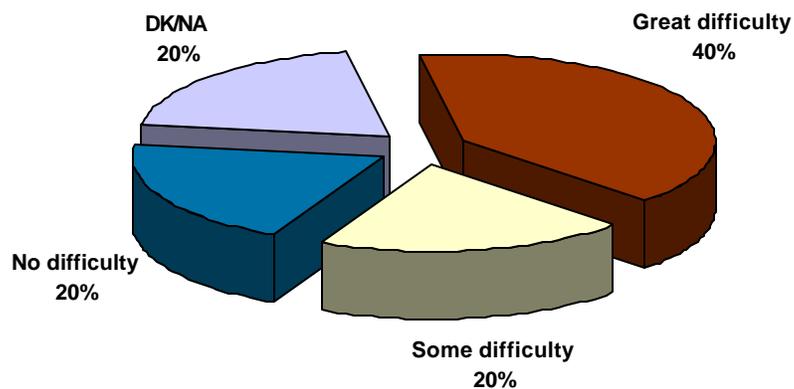
Figure 9 shows that most Computer Software firms (75%) do not use GIS technology. Only five percent reported that GIS technology is present in their companies and a sizable percentage of respondents (20%) were unaware if their companies used GIS technology.

Figure 9 Use of GIS Technology



Of the five Computer Software firms that use GIS technology, two reported “Great difficulty,” one reported “Some difficulty,” and one reported “No difficulty” in finding employees within the firm with the necessary GIS skills.

Figure 10 Difficulty Finding Employees with GIS Skills (n = 5)



## COMPUTER SOFTWARE: OCCUPATIONAL ANALYSIS

---

Nine occupations were investigated in the Computer Software cluster: Software Engineers, Software Programmers, Systems and Database Administrators, Customer Support Specialists, Project Managers, Technical Writers, Inspectors, Testers, and Quality Assurance Auditors, Network Systems Administrators, and Sales Representatives.

Respondents were first asked if their business employed individuals for any of the nine occupations included in the survey. Respondents were then asked detailed, occupation-specific questions about four randomly selected occupations from among those present at their company.

Q18. As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation.

Q19. How many of the current \_\_\_\_\_, do you expect, will **NOT** be working at this company in the same position **12 months from now**?

Q20. As I read each of the following occupations, please tell me how many total individuals you estimate will be employed in each of the occupations **12 months from now**.

Respondents in the Computer Software cluster were asked about their expectations for occupational turnover and growth over the next 12 months. The results presented in Table 3 show that “Customer Support Specialists” (31%) and “Software Programmers” (24%) are expected to have the highest turnover rate in the next year. Conversely, “Technical Writers” were projected to have the lowest turnover rate (2%).

While all of the Computer Software occupations anticipated robust growth in the coming year, “Inspectors, Testers, and Quality Assurance Auditors” (21%) and “Sales Representatives” (20%) had particularly high 12-month expected growth rates.

Based on the turnover and growth rates, we can project the number of openings that will become available in the next year. “Customer Support Specialists” (405), “Sales Representatives” (384), “Software Programmers” (326), and “Software Engineers” (168) will have the most openings in the next 12 months.

Table 3 Occupational Retention and Turnover Over the Next 12 Months

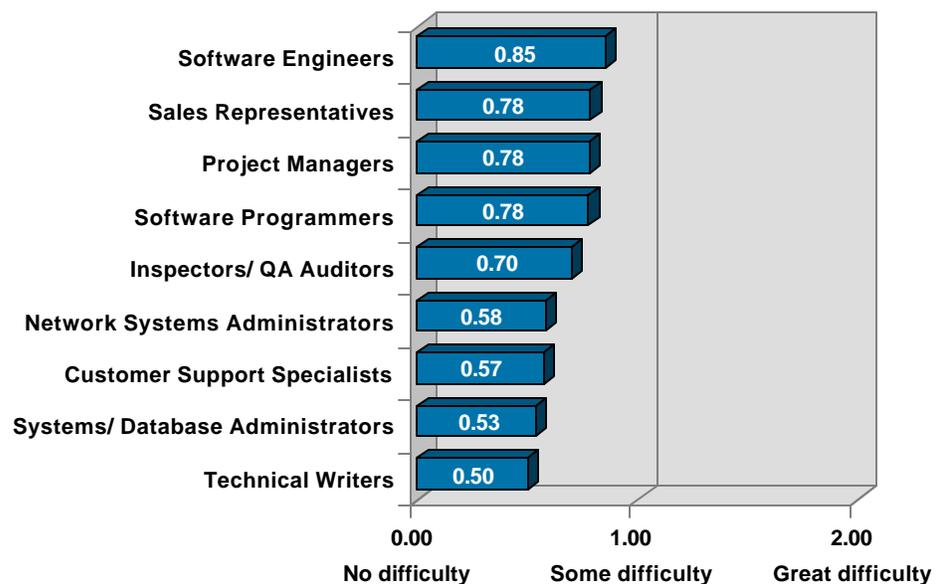
	<b>Number Employed</b>	<b>% of Cluster Employment</b>	<b>Expected Turnover</b>	<b>Growth Rate</b>	<b>Openings</b>
<b>Sales Representatives</b>	1,204	8.2%	12%	20%	384
<b>Customer Support Specialists</b>	989	6.8%	31%	10%	405
<b>Software Engineers</b>	836	5.7%	6%	14%	168
<b>Software Programmers</b>	831	5.7%	24%	15%	326
<b>Project Managers</b>	589	4.0%	5%	7%	74
<b>Systems/ Database Administrators</b>	431	3.0%	12%	17%	126
<b>Network Systems Administrators</b>	379	2.6%	8%	14%	84
<b>Technical Writers</b>	347	2.4%	2%	6%	26
<b>Inspectors/ QA Auditors</b>	252	1.7%	15%	21%	89
<b>Cluster Total</b>	14,611	100%			

Respondents were subsequently asked whether they had “Great difficulty,” “Some difficulty,” or “No difficulty” finding qualified applicants for each of the Computer Software occupations. To ease interpretation of the results, responses to this question were coded in the following manner: “Great difficulty” = +2, “Some difficulty” = +1, and “No difficulty” = 0. The aggregate responses to each item are presented below in the form of a mean, which is simply a summary statistic obtained by taking the overall average of the response codes for the entire sample. A mean of 1.00, for example, indicates that, overall, respondents felt that they had “Some difficulty” finding qualified candidates for that particular occupation.

Q21. For the same list of occupations, I'm interested in the level of difficulty your business has in finding applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding applicants.

On average, firms did not report much difficulty finding applicants who meet their hiring standards, with the mean ratings falling between “No difficulty” and “Some difficulty” for all of the occupations. Firms indicated the most difficulty finding qualified “Software Engineers” (0.85), “Sales Representatives” (0.78), “Project Managers” (0.78), and “Software Programmers” (0.78). Conversely, firms reported the lowest difficulty levels finding qualified “Technical Writers” (0.50).

Figure 11 Mean Difficulty Finding Qualified Applicants

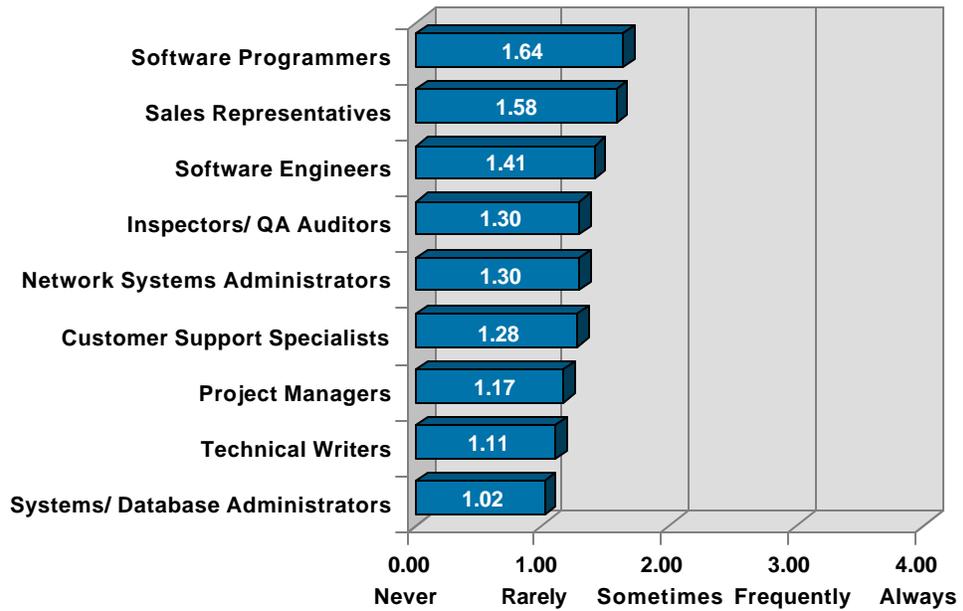


Next, respondents were asked how often they recruited candidates outside of Orange County for each occupation. Answers to this question were coded such that “Always” = +4, “Frequently” = +3, “Sometimes” = +2, “Rarely” = +1, and “Never” = 0.

Q22. We're interested in how often your business recruits individuals from outside of Orange County for an occupation. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside of Orange County for that occupation.

For each occupation, firms in the Computer Software industry indicated that, on average, they “Rarely” or “Sometimes” recruit individuals from outside of Orange County. Firms reported the highest frequency of recruiting outside the County for “Software Programmers” (1.64) and “Sales Representatives” (1.58). Companies were least likely to seek “Systems and Database Managers” (1.02) from outside of the County.

Figure 12 Mean Frequency of Hiring Outside of Orange County



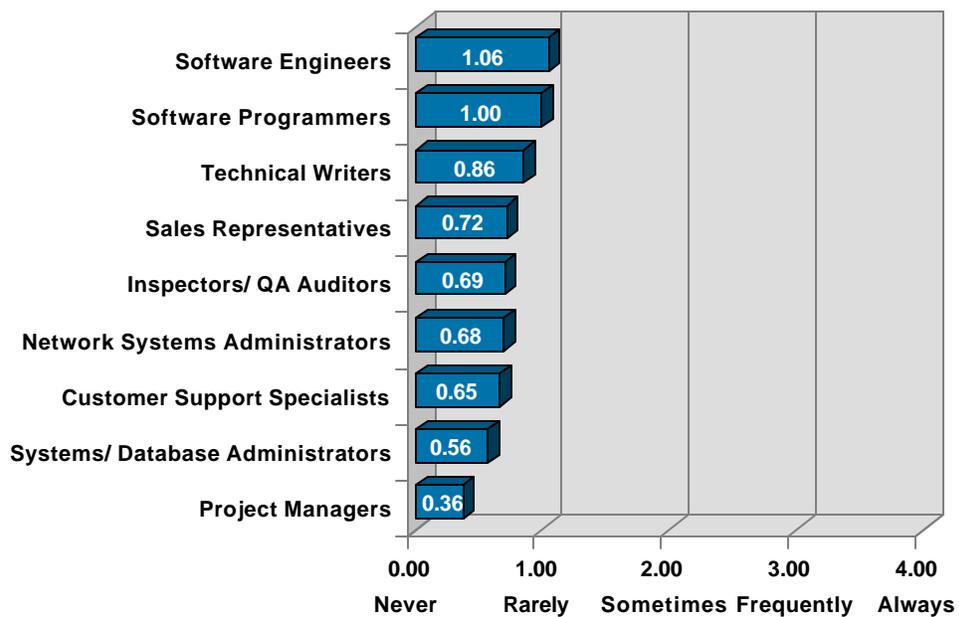
Using the same frequency scale as the previous question, respondents were asked how often their businesses hire part-time and temporary workers, respectively. An average frequency score of 2.00 would indicate that the Computer Software firms “Sometimes” hired part-time or temporary workers at their business location.

Q23. For the same list of occupations, we’d like to know how often your business hires **part-time** workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires **part-time** workers for that occupation.

Q24. Same question, only this time we’re interested in **temporary workers**. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires **temporary workers** for that occupation.

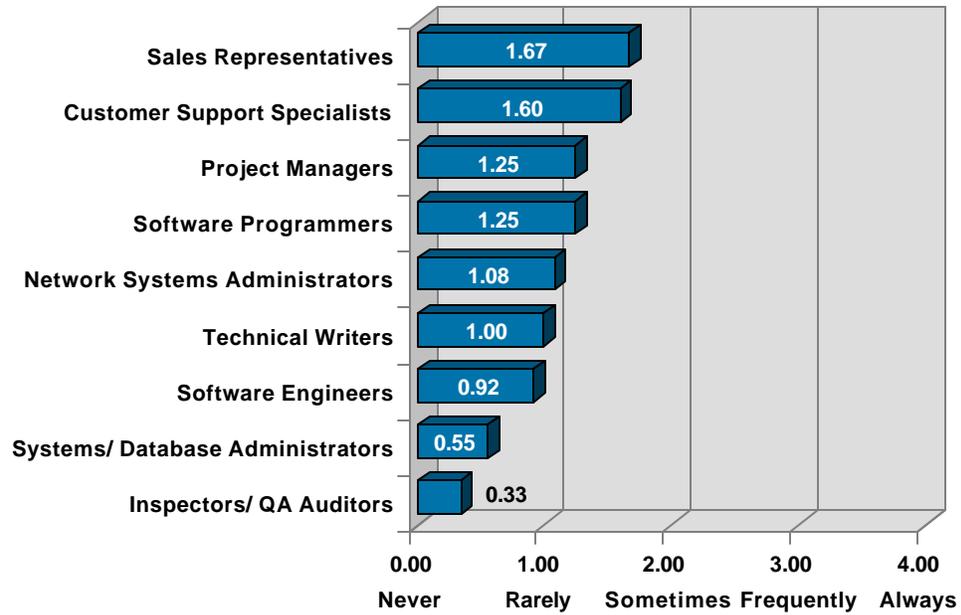
In general, Computer Software firms hired “Software Engineers” (1.06) and “Software Programmers” (1.00) in part-time positions with greater frequency than they did for the other occupations. Even so, their frequency of hiring part-time position was closer to “Rarely” than “Sometimes.” Respondents were least likely to hire part-time “Project Managers” (0.36).

Figure 13 Mean Frequency of Hiring Part-Time Employees



Within the Computer Software cluster, the frequency of hiring temporary workers varied from one occupation to the other. Specifically, on average firms “Rarely” to “Sometimes” hired “Sales Representatives” (1.67), “Customer Support Specialists” (1.60), “Project Managers” (1.25), “Software Programmers” (1.25), “Network Systems Administrators” (1.08), and “Technical Writers” in temporary positions. Firms reported a very low frequency of hiring temporary “Inspectors, Testers, and Quality Assurance Auditors” (0.33) and “Systems and Database Administrators” (0.55).

Figure 14 Mean Frequency of Hiring Temporary Employees



## COMPUTER SOFTWARE: OCCUPATIONAL WAGES

---

Investigating wage data as part of an occupational survey can present specific challenges. Depending on the occupation, five to ten percent of respondents either refused to answer the typical pay range for each occupation or stated they did not know the range. Where the number of firms responding to an occupation is already relatively low, it can be particularly problematic to gather enough wage data to create a representative sample. For Computer Software, however, only the Network and Database Administrators and Inspectors, Testers, and Quality Assurance Auditors received less than 25 responses for both low (entry-level) and high (experienced) wages.

For those respondents that did provide the occupational wage range information, the issue of strategic bias should be considered, particularly in the case where the wages seem to be lower than what might be expected. This bias occurs when a respondent acts strategically to affect the survey, in this case lowering the response for the typical wage for an occupation, with the thought that lower published wages will cause prospective employees to accept lower wages. In addition, we cannot discern whether the wages reported by the firm applies only to full-time employees, part-time employees, or both.

As shown in Table 4, Project Managers had the highest median<sup>i</sup> low (entry-level) annual wage (\$52,500); however, Software Engineers had the highest median high (experienced) annual wage (\$85,000) of the Computer Software occupations examined. Quality Assurance Auditors (\$53,000) and Customer Support Specialists were the only occupations to receive less than \$60,000 as the high (experienced) mean<sup>ii</sup> wage.

<sup>i</sup> The median wage represents the mid point in the range of responses if data points are put in sequential order. For Project Managers the low (entry-level) median wage of \$52,500 means that half of the low wages given for Employment Interviewers lie above \$52,500 and the other half of Employment Interviewers low wages lie below \$52,500.

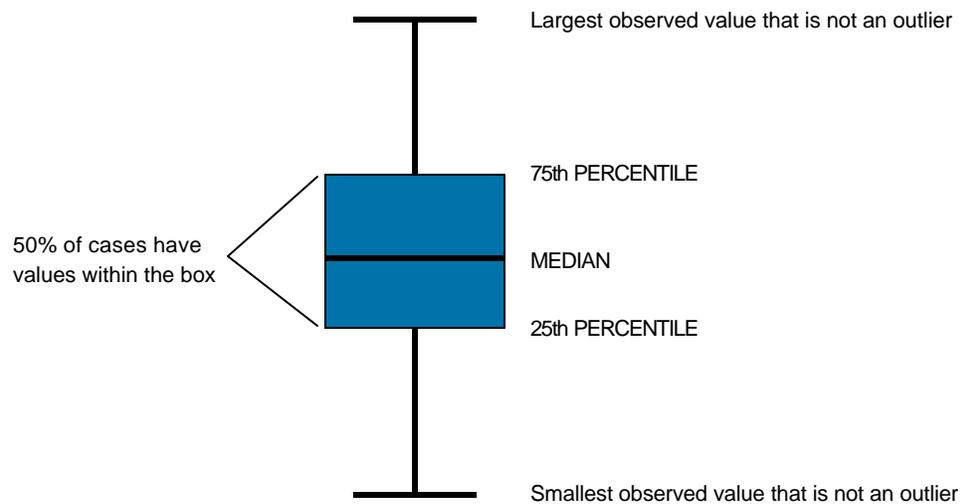
<sup>ii</sup> The mean wage can also be called the average wage and is derived by adding all the responses for wages and then dividing by the number of responses.

Table 4 Annual Wages for Entry-Level (Low) and Experienced (High) Employees by Occupation

		Median	Mean	N
Project Managers	Low	\$52,500	\$56,222	36
	High	\$75,000	\$74,428	36
Software Engineers	Low	\$50,000	\$55,901	34
	High	\$85,000	\$94,985	34
Software Programmers	Low	\$50,000	\$50,978	27
	High	\$80,000	\$81,667	27
Technical Writers	Low	\$50,000	\$48,767	18
	High	\$70,000	\$70,922	18
Systems Administrators	Low	\$43,000	\$49,197	35
	High	\$60,000	\$67,571	35
Network Administrators	Low	\$40,000	\$46,056	25
	High	\$62,500	\$69,046	26
Sales Representatives	Low	\$39,000	\$41,624	40
	High	\$80,000	\$82,854	41
Quality Assurance Auditors	Low	\$30,000	\$34,348	13
	High	\$53,000	\$56,194	13
Customer Support Specialists	Low	\$30,000	\$33,264	33
	High	\$40,000	\$54,212	33

Data from Table 4 can be used to present each occupation's wage range in the form of boxplot diagrams for the low (entry-level) and high (experienced) annual wages (see Figures 10 and 11). Boxplot diagrams present a distribution of the wage information received for each occupation. Half of the wage responses fall within the shaded box: the middle line within the box represents the median wage, and the outside edges of the shaded box represent responses at the 25th percentile and 75th percentile. The horizontal lines outside of the shaded box indicate the smallest and largest wage responses that are not outliers<sup>iii</sup>. Therefore, the vertical line between the two horizontal ones captures the entire range of responses (excluding outliers) (see Figure 15 below).

Figure 15 Interpreting a Boxplot Diagram



<sup>iii</sup> Outliers in the context of the boxplot diagram are defined as those responses that are more than 1.5 shaded box lengths from the 25th or 75th percentile.

Project Managers and Software Engineers had the largest wage ranges for entry-level (low) wages. In other words, these occupations had more variability in entry-level wages than for other Computer Software occupations. In addition to these two occupations, Sales Representatives also had a large variability in their range of experienced (high) wages (see Figure 16 and Figure 17).

Figure 16 Distribution of Entry-Level (Low) Annual Wages

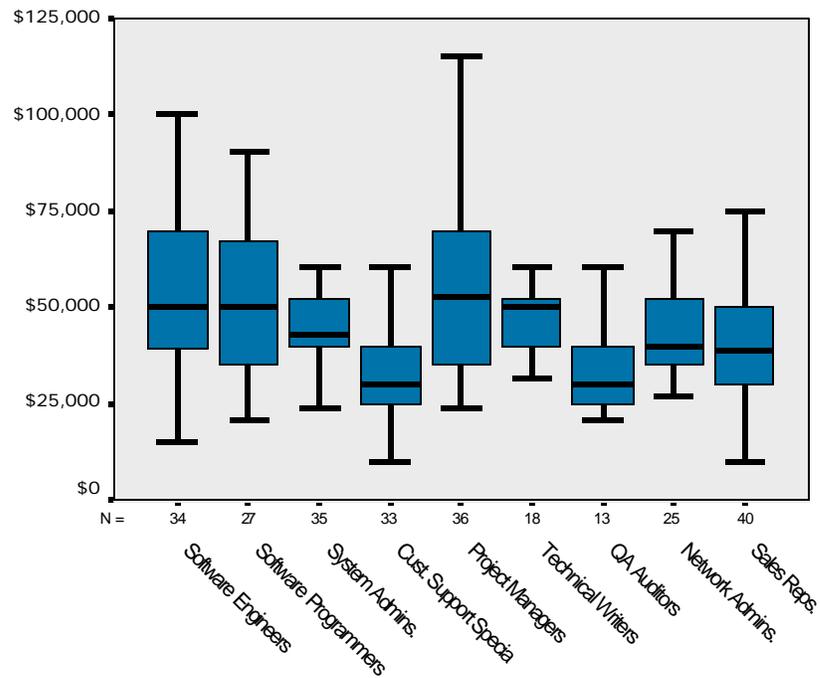
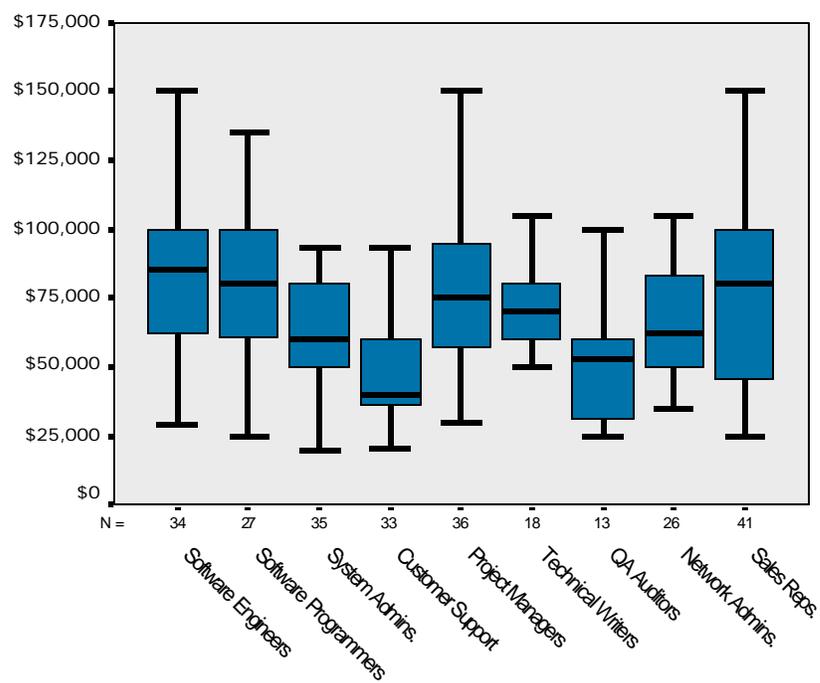


Figure 17 Distribution of Experienced (High) Annual Wages



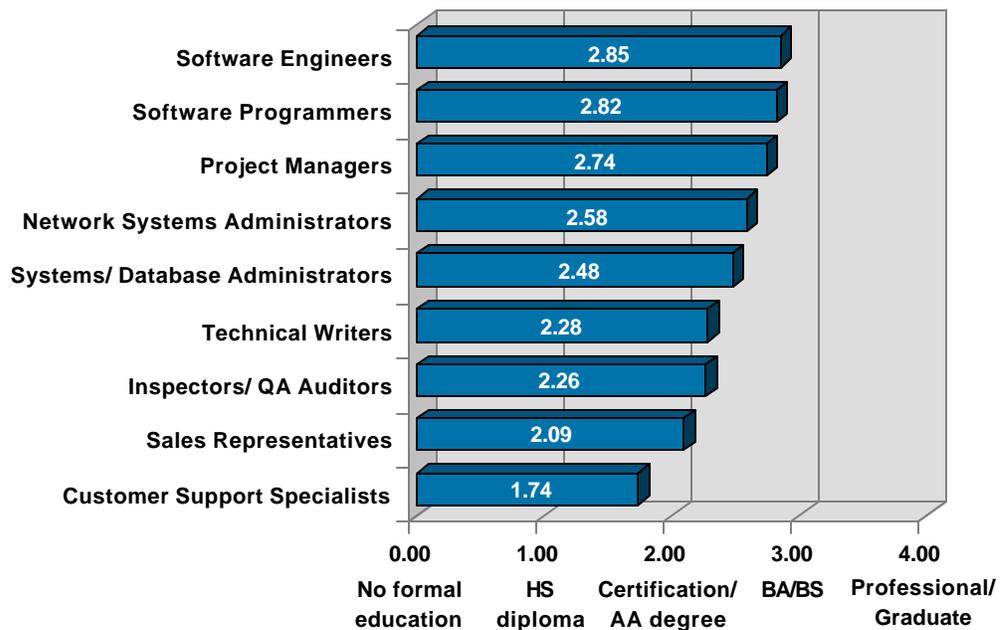
## COMPUTER SOFTWARE: EDUCATION AND SKILL OCCUPATIONAL ASSESSMENT

To get an idea of the level of training needed for each of the occupations in the Computer Software cluster, respondents were asked to indicate the *typical* education level required for successful applicants within each of the occupations. Responses to this question were coded according to the following education scale: “Professional or Graduate Degree” = +4, “Bachelor’s Degree” = +3, “Certification or Associate’s Degree” = +2, “Completion of High School or Equivalency” = +1, and “No formal education” = 0.

Q23. Next, for the same list of occupations, I'd like to know what are the **typical** education requirements for successful applicants within each occupation. The categories are: (INTERVIEWER READ OPTIONS). Okay, here's the (first/next) one: \_\_\_\_\_. What are the **typical** education requirements for successful applicants in this occupation at your business location?

On average, “Software Engineers” (2.85), “Software Programmers” (2.82), and “Project Managers” (2.74) typically required the most formal education among job applicants. In addition, “Network Administrators” (2.58), “Systems and Database Administrators” (2.48), “Technical Writers” (2.28), “Inspectors, Testers, and Quality Assurance Auditors” (2.26), and “Sales Representatives” (2.09) had mean typical education requirements between Certification/AA Degree and a college degree. Comparatively, “Customer Support Specialists” (1.74) had the lowest typical educational requirements. Firms reported that, on average, successful applicants in the Computer Software field needed at least a certificate or AA degree in eight of the nine COMP occupations tested in the survey.

Figure 18 Mean Typical Education Requirements



In the last substantive section of the survey, respondents were read a list of general employment skills. Then they were asked to name the most important skill candidates should have when applying for a job with the company for each Computer Software occupation. In addition, a follow-up question asked respondents which skill that their current employees in the occupation were most deficient in. These results are shown in Figure 19 through Figure 27

Q27. I'm going to read a list of general skills. Please tell me which one of these skills is **most important** when considering applicants for \_\_\_\_\_ (READ OCCUPATION).

Q28. I'm going to read the same list of general skills once more. Please tell me which of these skills your \_\_\_\_\_ (READ OCCUPATION) are currently **most deficient** in.

“Technical competence specific to the position” was the most important to respondents when hiring for six out of the nine Computer Software occupations, whereas “Interpersonal and communication skills” was the most important for three out of the nine Computer Software occupations. Technical competence was particularly important for Systems and Database Administrators (64%), Network System Administrators (63%), Technical Writers (63%), Software Engineers, and Software Programmers (50%). “Interpersonal and communication skills” were important for Customer Support Specialists (47%) and Sales Representatives (41%).

Respondents were more varied in assessing deficiencies of their employees in the various Computer Software occupations. Respondents identified a lack of communication skills for employees in five out of the nine occupations, and a lack of technical competence in four of the nine occupations. For those occupations that technical competence was most important, employers were concerned about their interpersonal and communication skills—Inspectors, Testers, and Quality Assurance Auditors (50%), Software Programmers (46%), Software Engineers (44%), Network Systems Administrators (42%), and Systems and Database Administrators (38%).

Figure 19 Occupation Skill Assessments: Software Engineers

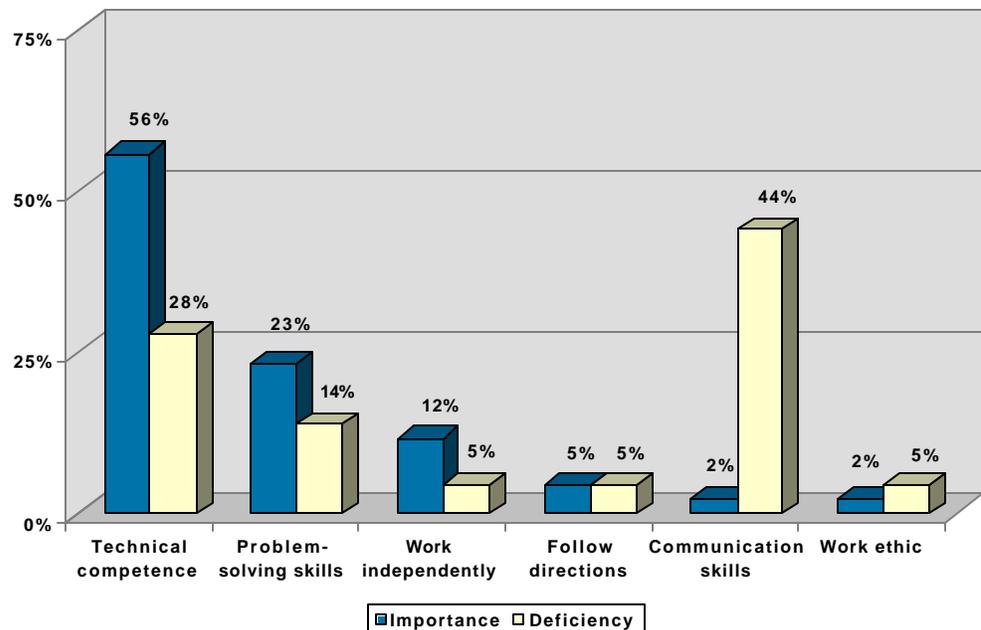


Figure 20 Occupation Skill Assessments: Software Programmers

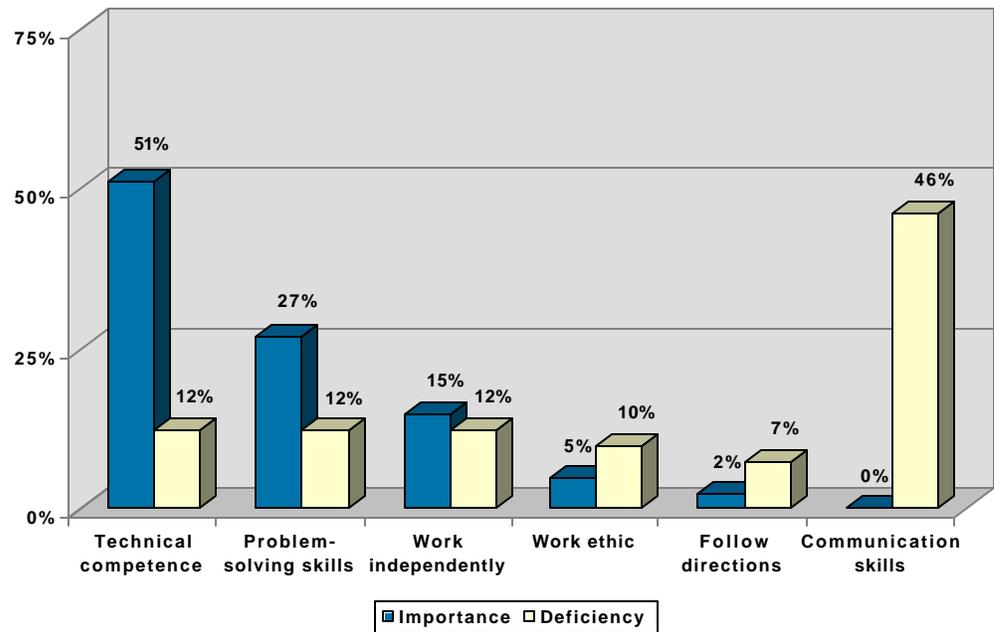


Figure 21 Occupation Skill Assessments: Systems and Database Administrators

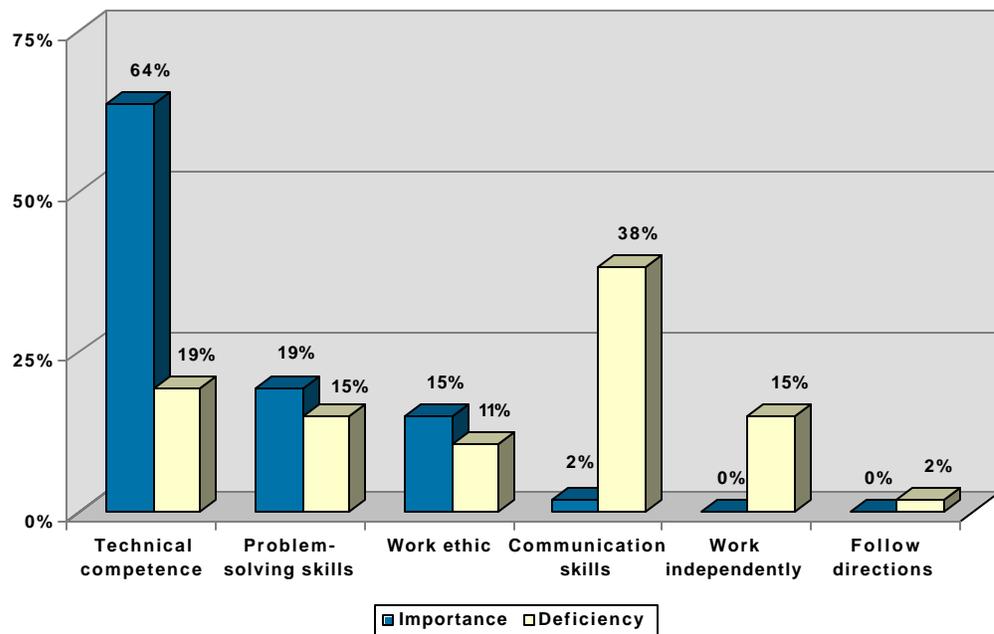


Figure 22 Occupation Skill Assessments: Customer Support Specialists

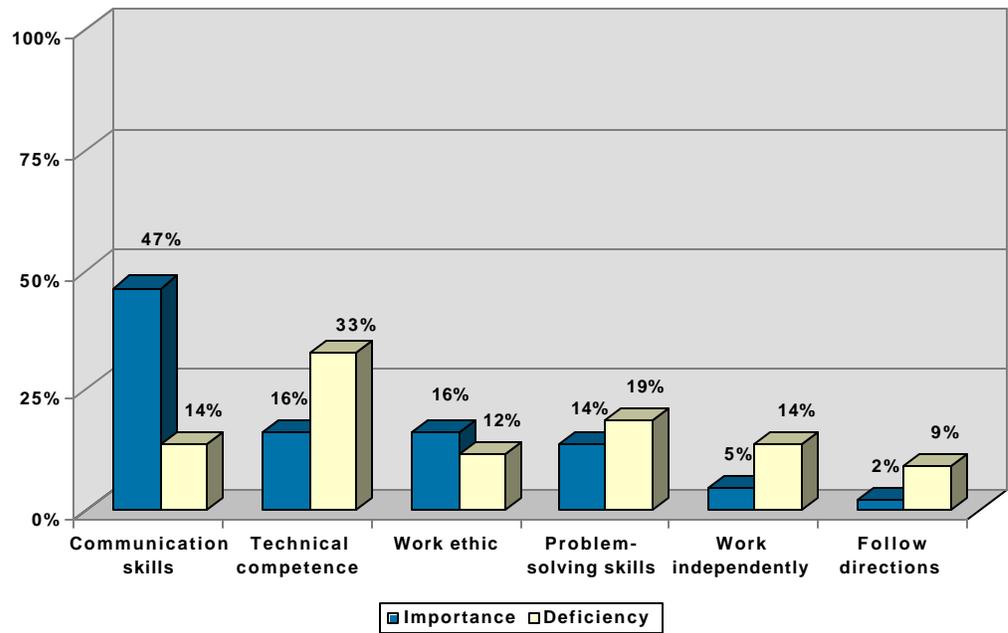


Figure 23 Occupation Skill Assessments: Project Managers

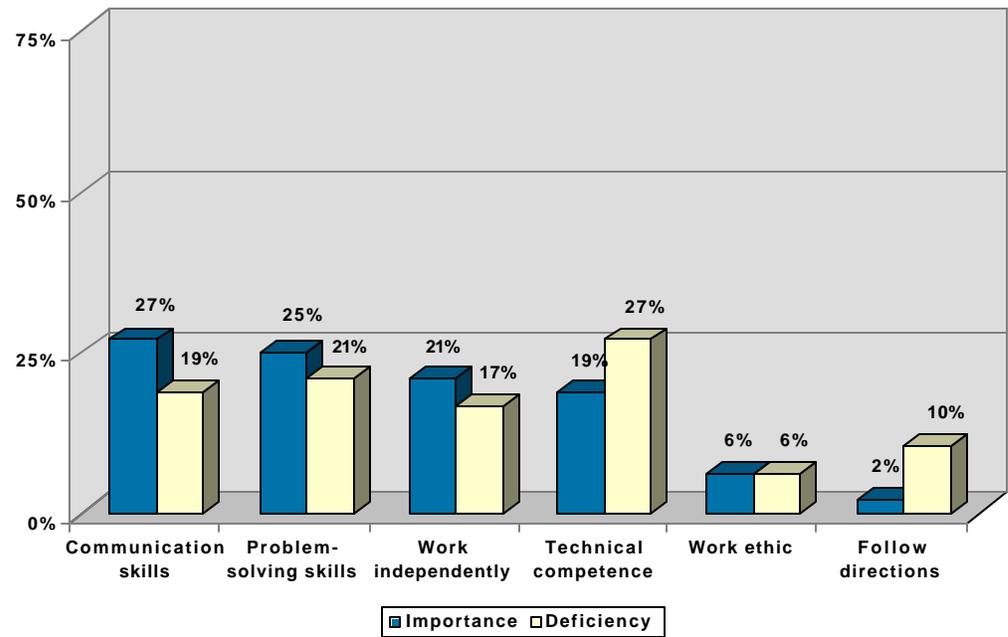


Figure 24 Occupation Skill Assessments: Technical Writers

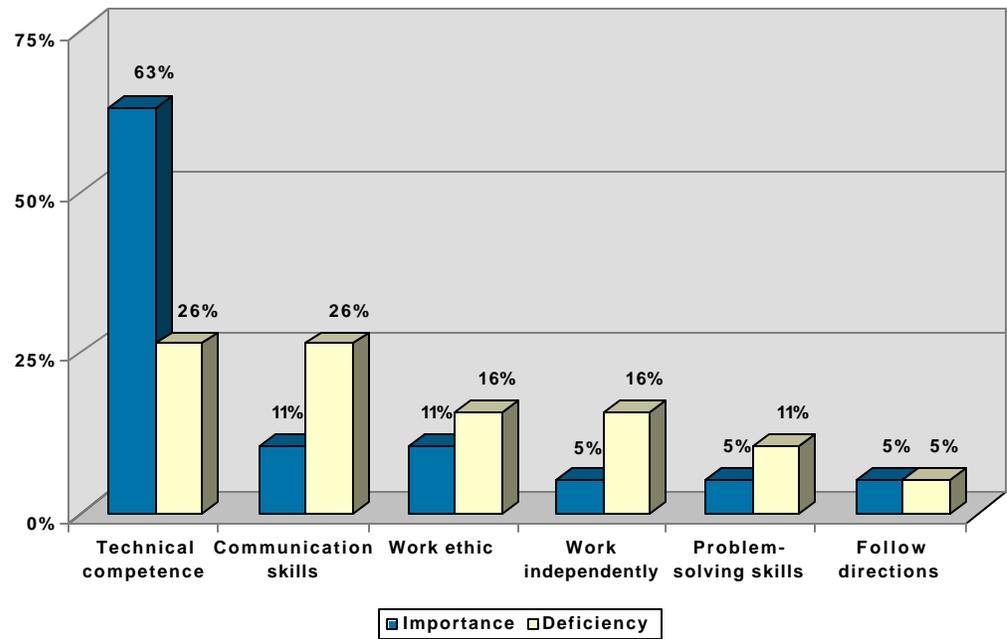


Figure 25 Occupation Skill Assessments: Inspectors, Testers, and Quality Assurance Auditors

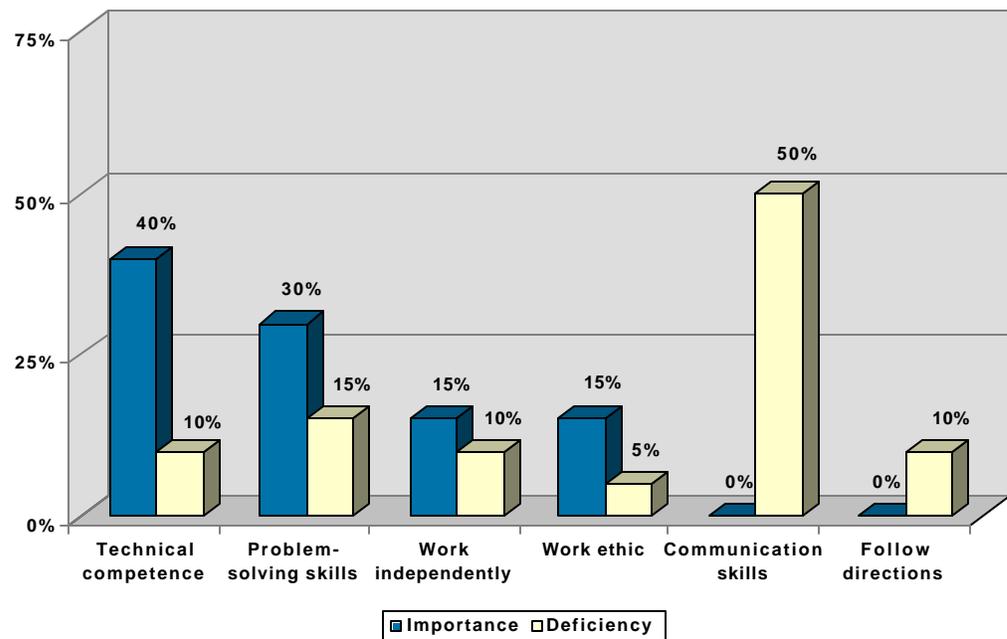


Figure 26 Occupation Skill Assessments: Network Systems Administrators

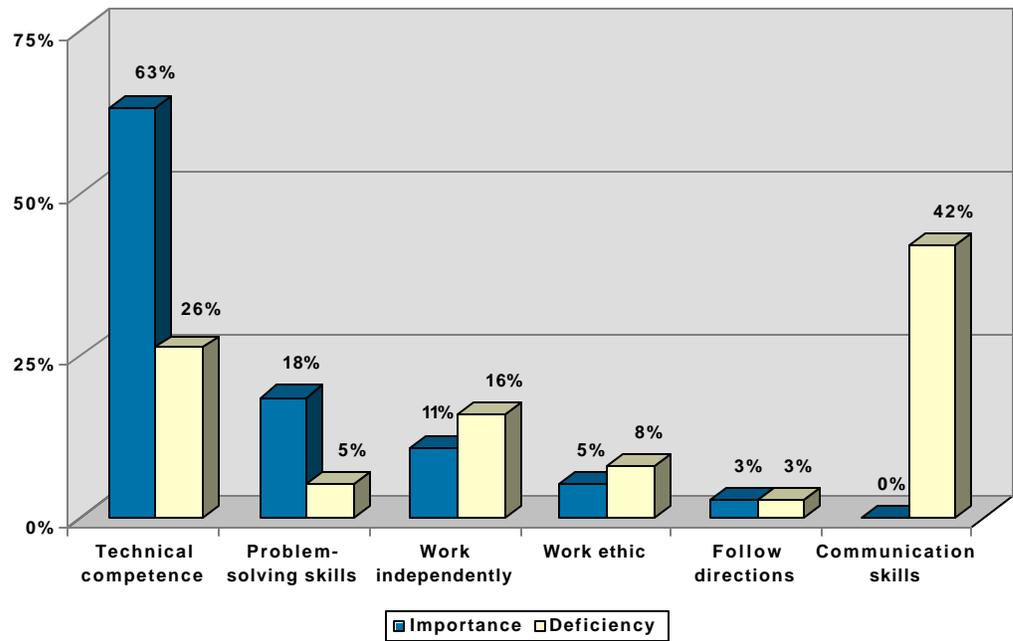
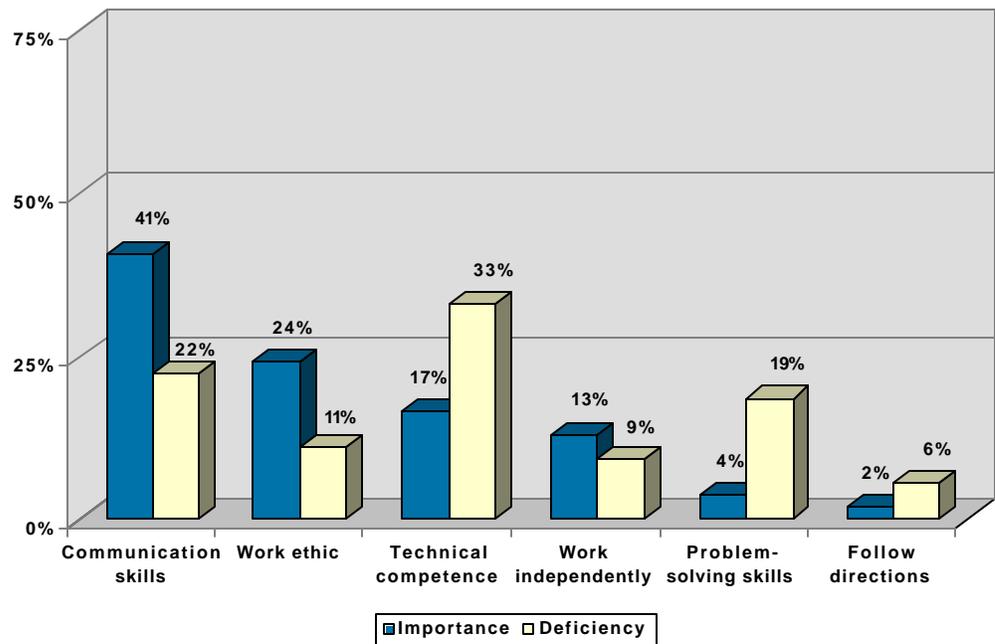


Figure 27 Occupation Skill Assessments: Sales Representatives



## APPENDIX A: METHODOLOGY

---

Table 5 briefly outlines the methodology used in this project. Using a database compiled from InfoUSA and Inside Prospects, firms with at least five employees in the Computer Software cluster were called to complete either a phone survey interview or an Internet survey (n = 100), representing a total of 1,528 Computer Software firms in Orange County. Interviews were conducted from August 26 through September 22, 2004 and each interview typically lasted 20 to 30 minutes.

Table 5 Summary of Survey Methodology

<b>Technique</b>	Telephone Interviewing and Internet Survey
<b>Universe</b>	Firms from the Computer Software cluster located in Orange County with at least five employees
<b>Field Dates</b>	August 26 - September 22
<b>Interview Length</b>	20-30 minutes
<b>Sample Size</b>	100 Computer Software firms

Sample size was driven by the goal to interview as many firms in the Computer Software cluster as was possible. For COMP, the margin for error was at  $\pm 9.48\%$ . Because the number of firms employing individuals in each of the Computer Software occupations was lower than the overall number of firms in the sample, the occupational data is less reliable than the data for the industry analysis.

### Industry Description

Firms included in the Computer Software cluster were chosen based on the following North American Industry Classification System (NAICS) codes: 334611 Software reproducing, 511210 Software publishers, 518111 Internet service providers, 532420 Office equipment rental and leasing, 541511 Custom computer programming services, 541512 Computer systems design services, and 541519 Other computer related services.

### Occupation Descriptions

The table below gives the title, O\*NET – SOC code, and occupation description of the Computer Software occupations used for this study. Further information about these occupations can be found at <http://online.onetcenter.org>.

Table 6 Occupation Descriptions

Occupation	Description
Software Engineers 15-1031	Develop, create, and modify general computer applications software or specialized utility programs. May analyze and design databases within an application area, working individually or coordinating as part of a team.
Software Programmers 15-1021	Convert project specifications and statements of problems and procedures to detailed logical flow charts for coding into computer language. Develop and write computer programs to store, locate, and retrieve specific documents, data, and information. May program web sites.
Systems Administrators / Database Administrators 15-1061	Includes database administrators and network administrators. Plan layout and installation of new systems or modifications of existing systems; may set up and control computer systems to solve scientific and engineering problems.
Customer Support Specialists 15-1041	Provide technical assistance and training to computer system users. Investigate and resolve computer software and hardware problems of users. Answer clients' inquiries in person and via telephone.
Project Managers 11-3021	Plan, organize, and direct activities in such fields as electronic data processing, engineering, life sciences, physical sciences, statistics, systems analysis, and architecture. These employees spend the greatest portion of their time managing projects.
Technical Writers 27-3042	Create content on websites, or write user documentation, or write or edit technical materials. May oversee preparation of illustrations and charts and assist in layout work.
Inspectors, Testers, and Quality Assurance Auditors 51-9061	Perform precision inspecting, testing, and grading of parts, and equipment for defects, and deviations from specifications. The majority of these workers use precision measuring instruments.
Network Systems Administrators 15-1071	Analyze data processing requirements to plan EDP system to provide system capabilities required for projected workloads.
Sales Representatives 41-4011	Sell goods or services requiring scientific or similar knowledge in such areas as engineering, electronics, chemistry, and biology.

## Understanding the “Margin of Error”

Because a survey only contains responses from a limited number of firms, who are part of a larger population group, by mere chance alone there will almost always be some difference between a sample and the population from which it was drawn. For example, researchers might collect information from 100 companies in a town of 2,500 companies. Because not all firms in the population were surveyed, there are likely to be differences between the results obtained from interviewing the sample respondents and the results that would be obtained if all firms in the population were interviewed. These differences are known as “sampling error,” and they can be expected to occur regardless of how scientifically the sample has been selected. The advantage of using a scientifically drawn sample, however, is that the maximum amount of sampling error can be determined based on four factors: the size of the population, the chosen sample size, a confidence level, and the dispersion of responses to a survey question. Of the four factors, sample size is the most influential variable.

Table 7 shows the sampling variation that applies to various percentage results that might have been obtained through the survey. The table shows that if a sample of 100

firms is randomly drawn from the estimated 1,528 Computer Software firms in Orange County, one can be 95 percent confident that the margin of error, due to sampling, will not vary by more than the indicated number of percentage points (plus or minus) from the result that would have been obtained if the interviews had been conducted with all people in the universe represented in the sample.

Table 7 Margin of Error

<i>n</i>	Distribution of Responses				
	90% / 10%	80% / 20%	70% / 30%	60% / 40%	50% / 50%
<b>1,000</b>	1.09%	1.46%	1.67%	1.79%	1.82%
<b>900</b>	1.26%	1.68%	1.92%	2.05%	2.09%
<b>800</b>	1.44%	1.91%	2.19%	2.34%	2.39%
<b>700</b>	1.64%	2.18%	2.50%	2.67%	2.73%
<b>600</b>	1.87%	2.50%	2.86%	3.06%	3.12%
<b>500</b>	2.16%	2.88%	3.30%	3.52%	3.60%
<b>400</b>	2.53%	3.37%	3.86%	4.13%	4.21%
<b>300</b>	3.04%	4.06%	4.65%	4.97%	5.07%
<b>200</b>	3.88%	5.17%	5.92%	6.33%	6.46%
<b>100</b>	5.69%	7.58%	8.69%	9.29%	9.48%
<b>50</b>	8.18%	10.91%	12.50%	13.36%	13.64%

As the table indicates, the maximum margin of error for all aggregate responses is between 5.69 and 9.48 percent for the sample of 100 COMP firms. This means that for a given question answered by all respondents, one can be 95 percent confident that the difference between the percentages reported here based on the responses of the sample population, and the percentages that would be calculated for responses from the total population, is no greater than 9.48 percent. The percent margin of error applies to both sides of the answer, so that for a question in which 50 percent of respondents said yes, one can be 95 percent confident that the actual percent of the population that would say yes is between 40.52 percent and 59.48 percent (see the last column of Table 7).

The actual margin of error for a given question in this survey depends on the distribution of the responses to the question. The 9.48 percent refers to dichotomous questions, such as a “Yes” or “No” question, where opinions were evenly split in the sample, with 50 percent of respondents saying “Yes” and 50 percent saying “No.” If that same question were to receive a response in which 10 percent of respondents said “Yes” and 90 percent said “No,” the margin of error would be no greater than 5.69 percent (see the first column of Table 7). As the number of respondents in a particular subgroup (e.g., occupation) is smaller than the number of total respondents, the margin of error associated with estimating a given subgroup's responses will be higher. For this reason Godbe Research cautions referencing subgroups with fewer than 25 responses.

## Questionnaire Design

### Randomization of Questions

To avoid the problem of systematic position bias -- where the order in which a series of questions is asked systematically influences the responses that participants give --

several questions in this survey were randomized such that respondents were not consistently given response options in the same order. The series of items within Questions 10, 14, and 27 were randomized for each interview.

#### Occupation Selection for Questions

Due to the length of the occupational questions (questions 17 through 30) respondents were asked questions for as many as four occupations if the survey was completed over the phone and up to five occupations if the survey was completed online. If a firm indicated that they had more than four of the occupations being evaluated (or five for the online survey), the occupations that were used for questions 17 through 30 were initially determined randomly. After a few weeks of data collection, certain occupations that had a lower response rate were given a higher priority and were automatically included for questions 17 through 30, if that particular occupation was employed at the specific firm.

#### Multiple Response Questions

Some questions within the survey were presented as a multiple response format. For this type of question, each respondent is given the opportunity to select more than one response option. For this reason, the response percentages will typically sum to more than 100 and represent the percentage of individuals that mentioned a particular response.

## Tables and Charts

The body of this report presents a wide variety of tables, charts, and analytical formats. This section of the Methodology describes the conventions underlying these analyses.

#### Understanding a “Mean”

In addition to analysis of response percentages, many results will be discussed with respect to a descriptive “Mean.” To derive a mean, or average, that represents perceived difficulty in finding qualified applicants (Q21), for example, a number value is first assigned to each response category (e.g., “Great difficulty” = +2, “Some difficulty” = +1, “No difficulty” = 0). The answer of each respondent is then assigned the corresponding number (from 0 to +2, in this example). Finally, all respondents’ answers are averaged to produce a final number that reflects the average perceived importance of the different issues. The resulting mean makes interpretation of the data considerably easier.

#### How to Read a “Means” Chart

In the charts for Questions 21 through 25 of the survey, the reader will find mean scores that represent answers given by respondents. The mean score represents the average response of each group. The following table shows the scales for each corresponding question. Responses of “Don’t know/No answer” are not included in calculating the means for any question.

Table 8 Means Questions and Corresponding Scales

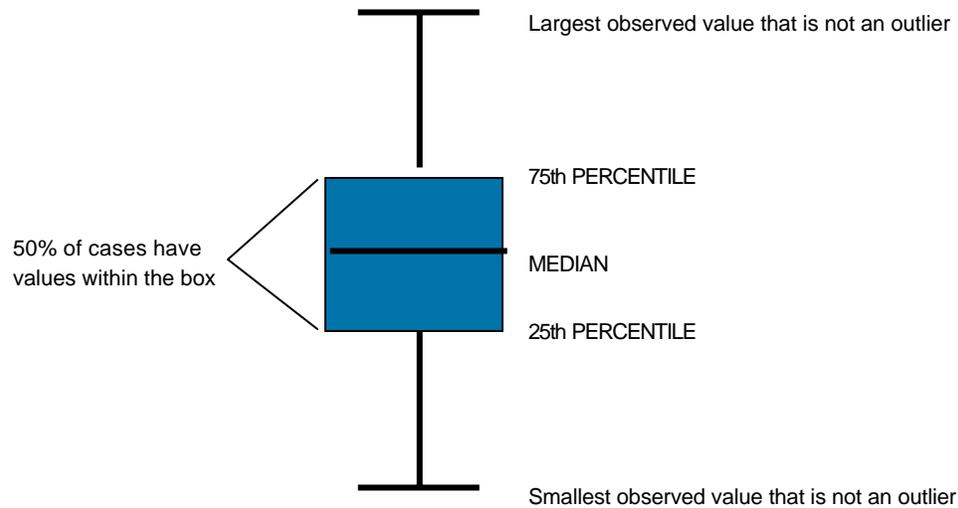
Question	Measure	Scale	Values
21	Difficulty Ratings	0 to +2	+2 = Great difficulty +1 = Some difficulty 0 = No difficulty

22, 23, 24	Frequency	0 to +4	+4 = Always +3 = Frequently +2 = Sometimes +1 = Rarely 0 = Never
25	Typical Education Levels	0 to +4	+4 = Graduate/Professional Degree +3 = Bachelor's Degree +2 = Certification/Associate's Degree +1 = High school diploma/GED 0 = No formal education

How to Interpret a Boxplot Chart

Used explicitly for the occupation wage data, boxplot diagrams present a distribution of the wage information received for each occupation. Half of the wage responses fall within the shaded box: the middle line within the box represents the median wage, and the outside edges of the shaded box represent responses at the 25th percentile and 75th percentile. The horizontal lines outside of the shaded box indicate the smallest and largest wage responses that are not outliers. Outliers were those data points that fell 1.5 boxes outside of the 25<sup>th</sup> and 75<sup>th</sup> percentiles. Therefore, the vertical line between the two horizontal ones captures the entire range of responses (excluding outliers) (see Figure 28 below).

Figure 28 Example of a Boxplot Diagram



A Note on “Rounding”

Conventional rounding rules are applied (i.e., numbers that include 0.5 or higher are rounded to the next highest whole number and numbers that include 0.4 or lower are rounded to the next lowest whole number). Because of rounding, the reader may notice that percentages in the discussion may not sum to 100 percent.

To display information relevant to a particular analysis in the most efficient manner possible, the sizing of table columns and fonts vary to fit the analytical needs.

APPENDIX B: SURVEY QUESTIONNAIRE

---

**Godbe Research & Analysis**  
**August 2004**  
**FINAL**

**Orange County Cluster Survey**  
**2004**

Hello, my name is \_\_\_\_\_. May I please speak to [name] or [the person handling human resource issues at [company]?]

Hello, my name is \_\_\_\_\_ and I'm calling on behalf of the Orange County Workforce Investment Board. I'm following up on a letter sent from [**Name of Cluster Signator**] asking you to participate in a survey that will address your future business needs for trained and educated employees.

As a token of appreciation, we will also enter participants who complete the survey into a drawing for a \$500 cash prize.

<< if needed>> The survey should take no more than ten minutes of your time. By answering this survey, you can help regional workforce agencies develop the appropriate type of training that will prepare the employees you will be looking for in the future.<<end of optional section 2>>

<< if needed>> The survey has been commissioned by the Orange County Workforce Investment Board, which is committed to developing the regional workforce. The survey is being conducted by Godbe Research, an independent research firm. <<end of optional section 3>>

(FOR THOSE WHO AGREE TO PARTICIPATE):

i. Do you have Internet access and e-mail at your work?

Yes -----1 (Go to Qii)  
No -----2 (Go to Qiv)  
Don't Know/Refuse-----3 (Go to Qiv)

ii. The survey can be taken on the Internet. If you provide me with your e-mail address, I can send you an e-mail with a link to the survey. (GET E-MAIL ADDRESS AND CONFIRM THAT IT IS CORRECT. THANK THEM AND ENCOURAGE THEM TO PARTICIPATE WHEN THEY RECEIVE THE E-MAIL).

(IF NEEDED): Your email address will be confidential and will not be used for any other purpose.

(WAS CONFIDENTIAL EMAIL STATEMENT USED?):

Yes -----1  
No -----2

(IF RESPONDENT REFUSES TO PROVIDE E-MAIL ADDRESS, GO TO Qiii)

- iii. Ok, we can either conduct the interview over the phone or we can provide you with the website address and a unique number [PIN #], which you can use to participate online. (IF CHOOSES URL, MAKE SURE TO CONFIRM RESPONDENT HAS WRITTEN DOWN THE CORRECT ADDRESS AND PIN #. IF CHOOSES PHONE, GO TO Qiv)
- iv. (FOR RESPONDENTS WHO ANSWERED NO OR DON'T KNOW TO Qi) We can take your survey responses by phone right now. (IF THE RESPONDENT INDICATES THAT NOW IS NOT A GOOD TIME, TRY TO SCHEDULE A MORE CONVENIENT TIME FOR A CALLBACK).
- v. Record PIN #: \_\_\_\_\_. (FROM SAMPLE SHEET IF PHONE RECRUITED. IF CALLED 1-888 PHONE NUMBER, ASK THEM TO READ THE PIN FROM THE LETTER)

---

---

First, I'd like to ask you a few general questions about your business.

- 1. How many permanent full-time employees work at your business location?  
Record # full-time: \_\_\_\_\_
- 2. How many permanent part-time employees work at your business location?  
Record # part-time: \_\_\_\_\_
- 3. How many temporary and/or seasonal employees currently work at your business location?  
Record # temporary: \_\_\_\_\_
- 4. Including all full-time and part-time employees, how many **permanent** employees do you expect to have 12 months from now?  
Record # employees: \_\_\_\_\_
- 5. How many temporary and/or seasonal employees do you expect to have 12 months from now?  
Record # temporary: \_\_\_\_\_

6. When a non entry-level position becomes available in your firm, do you more often hire from outside or promote from within the company?

- Promote from within-----1
- Even split (50-50 outside & promote) -----2
- Recruit from outside -----3
- (DON'T READ) Don't know-----4
- (DON'T READ) Refused -----5

7. How often does your business recruit individuals from outside the County but within the Southern California region for employment?

- Always -----1
- Frequently-----2
- Sometimes-----3
- Rarely-----4
- Never -----5
- (DON'T READ) Refused -----6

8. How often does your business recruit individuals from outside Southern California for employment?

- Always -----1
- Frequently-----2
- Sometimes-----3
- Rarely-----4
- Never -----5
- (DON'T READ) Refused -----6

9. In the next 3 years, what percentage of your current employees do you expect will retire?

Record % Retiring in next 3 years: \_\_\_\_\_

10. Next, I'm going to read a list of issues facing the region's workforce in the coming years, please tell me how much difficulty your firm faces in addressing these workforce needs.

Here's the (first/next) one: \_\_\_\_\_. Please tell me whether your business has no difficulty, some difficulty, or great difficulty in dealing with this issue.

**Randomize**

	<u>No difficulty</u>	<u>Some difficulty</u>	<u>Great difficulty</u>	<u>(DON'T READ) DK/NA</u>
A. Replacing retired workers with qualified employees within the firm-----	1	2	3	4
B. Replacing retired workers with qualified candidates from outside the firm -----	1	2	3	4
C. Developing strategies to retain valuable employees-----	1	2	3	4
D. Recruiting entry-level employees with adequate training and education -----	1	2	3	4
E. Recruiting non entry-level employees with adequate skills and experience -----	1	2	3	4
F. Recruiting employees with reasonable salary requirements-----	1	2	3	4

11. During the past two years, has your company relocated any of its business processes, including production and services, to a lower cost location outside of Orange County?

[NOTE IF ASKED: production includes software programming, research and development]

- Yes -----1 (CONTINUE)
- No -----2 (Skip to Q14)
- Don't know/Refused -----3 (Skip to Q14)

12. (IF RESPONDENT ANSWERED YES IN Q11, THEN ASK:) Which type of business process did your company relocate outside of the County? Did your company move its production or manufacturing processes, its services, or both?

- Production/Manufacturing-----1
- Services-----2
- Both -----3
- Other [Specify]-----4
- (DON'T READ) Don't know/Refused-----5

13. Where did your company relocate to outside of the County? [TRY AND GATHER CITY AND STATE OR IF OUTSIDE THE UNITED STATES GET COUNTRY AND CITY IF POSSIBLE]

Name of location -----  
 (DON'T READ) Refused -----98  
 (DON'T READ) Don't know-----99

14. Next, I'd like to ask you about employee development practices at your business location. As I read each of the following employee development practices, please indicate whether your business uses each practice.

**Randomize**

	<u>Yes</u>	<u>No</u>	<u>(Don't Read) DK/NA</u>
A. Formal on-the-job training -----	1	2	3
B. Informal on-the-job training -----	1	2	3
C. In-house classroom training -----	1	2	3
D. Career development programs/ Career ladders -----	1	2	3
E. Employer-paid outside training -----	1	2	3
F. Tuition assistance at a college or university-----	1	2	3

15. Does your firm use or have GIS or geospatial technology?

Yes -----1  
 No -----2 [SKIP TO Q17]  
 (DON'T READ) Do not know GIS -----3 [SKIP TO Q17]  
 (DON'T READ) Refused -----4 [SKIP TO Q17]

16. Has your firm had any difficulty hiring or finding employees internally with GIS or Geospatial technology skills? (IF YES) Is that some difficulty or great difficulty hiring or finding employees internally with GIS skills.

No difficulty -----1  
 Some difficulty -----2  
 Great difficulty-----3  
 (DON'T READ) Don't know/Refused -----4

## Occupation - Related Questions

17. Now, I'm going to ask you about specific occupations within your business/company. The occupational titles we are using may differ from the specific position titles used in your company. For these questions, I would like you to try to equate your company's specific position titles with the more generic ones we will use here. Please tell me if your company employs, at your location, individuals in positions matching the following generic occupational titles:

Here's the (first/next) one: \_\_\_\_\_ (READ ITEM & BRIEF DEFINITION, THEN ASK): Do you have employees who fit this occupational description at your business location?

Occupational List <<number of occupations is dependent on cluster>>

- 1 (occupation 1 – brief definition)
- 2 (occupation 2 – brief definition)
- 3 (occupation 3 – brief definition)
- 4 (occupation 4 – brief definition)
- 5 (occupation 5 – brief definition)
- 6 (occupation 6 – brief definition)
- 7 (occupation 7 – brief definition)
- 8 (occupation 8 – brief definition)
- 9 (occupation 9 – brief definition)
- 10 (occupation 10 – brief definition)
- 11 (occupation 11 – brief definition)
- 12 (occupation 12 – brief definition)

(RANDOMLY SELECT UP TO 4 OF THE OCCUPATIONS THAT THE RESPONDENT INDICATED ARE REPRESENTED AT THEIR BUSINESS LOCATION IN Q6. ASK Q.'S 18-30 IN THE SELECTED BUSINESSES – FOR INTERNET SURVEY SELECT UP TO 5 OF THE OCCUPATIONS THAT THE RESPONDENT INDICATED ARE REPRESENTED AT THEIR BUSINESS LOCATION)

Next, I'm going to ask you a few questions about several of the occupations you mentioned.

18. As I read each of the following occupations, please tell me how many individuals at your business location are currently employed in the occupation. (READ ITEMS IN SEQUENCE).

- A. Occupation 1 ----- ### (3 digit number)
- B. Occupation 2 ----- ### (3 digit number)
- C. Occupation 3 ----- ### (3 digit number)
- D. Occupation 4 ----- ### (3 digit number)

19. How many of the current \_\_\_\_\_ [USE NUMBER FROM ABOVE & NAME OF OCCUPATION], do you expect, will **NOT** be working at this company in the same position **12 months from now?**

- A. Occupation 1 ----- ### (3 digit number)
- B. Occupation 2 ----- ### (3 digit number)
- C. Occupation 3 ----- ### (3 digit number)
- D. Occupation 4 ----- ### (3 digit number)

**[This number can not be larger than the number in Q18 for each occupation]**

20. As I read each of the occupations, please tell me how many total individuals you estimate will be employed in each of the occupations **12 months from now.**

- A. Occupation 1 ----- ### (3 digit number)
- B. Occupation 2 ----- ### (3 digit number)
- C. Occupation 3 ----- ### (3 digit number)
- D. Occupation 4 ----- ### (3 digit number)

21. For the same list of occupations, I'm interested in the level of difficulty your business has in finding applicants who meet the company's hiring standards. As I read each occupation, please tell me whether your business has no difficulty, some difficulty, or great difficulty finding applicants. (READ IN SEQUENCE)

	<u>No</u> <u>difficulty</u>	<u>Some</u> <u>difficulty</u>	<u>Great</u> <u>difficulty</u>	<u>(DON'T</u> <u>READ)</u> <u>DK/NA</u>
G. Occupation #1 -----	1 -----	2 -----	3 -----	4 -----
H. Occupation #2 -----	1 -----	2 -----	3 -----	4 -----
I. Occupation #3 -----	1 -----	2 -----	3 -----	4 -----
J. Occupation #4 -----	1 -----	2 -----	3 -----	4 -----

22. We're interested in how often your business recruits individuals from outside of Orange County for an occupation. As I read each occupation, please indicate if you always, frequently, sometimes, rarely or never recruit individuals from outside of Orange County for that occupation.

	<u>Always</u>	<u>Frequently</u>	<u>Sometimes</u>	<u>Rarely</u>	<u>Never</u>	(DON'T READ) DK/NA
A. Occupation #1 -----	1	2	3	4	5	6
B. Occupation #2 -----	1	2	3	4	5	6
C. Occupation #3 -----	1	2	3	4	5	6
D. Occupation #4 -----	1	2	3	4	5	6

23. (ASK Q23 ONLY IF Q2 IS GREATER THAN 0) For the same list of occupations, we'd like to know how often your business hires **part-time** workers at your business location. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires **part-time** workers for that occupation.

	<u>Always</u>	<u>Frequently</u>	<u>Sometimes</u>	<u>Rarely</u>	<u>Never</u>	(DON'T READ) DK/NA
A. Occupation #1 -----	1	2	3	4	5	6
B. Occupation #2 -----	1	2	3	4	5	6
C. Occupation #3 -----	1	2	3	4	5	6
D. Occupation #4 -----	1	2	3	4	5	6

24. (ASK Q24 ONLY IF Q5 IS GREATER THAN 0) Same question, only this time we're interested in **temporary workers**. As I read each occupation, please indicate whether your business always, frequently, sometimes, rarely or never hires **temporary workers** for that occupation.

	<u>Always</u>	<u>Frequently</u>	<u>Sometimes</u>	<u>Rarely</u>	<u>Never</u>	(DON'T READ) DK/NA
A. Occupation #1 -----	1	2	3	4	5	6
B. Occupation #2 -----	1	2	3	4	5	6
C. Occupation #3 -----	1	2	3	4	5	6
D. Occupation #4 -----	1	2	3	4	5	6

25. Next, for the same list of occupations, I'd like to know what are the **typical** education requirements for successful applicants within each occupation. The categories are: (INTERVIEWER READ OPTIONS). Ok, here's the first one: (READ ITEM A). What are the **typical** education requirements for successful applicants in this occupation at your business location? (CONTINUE UNTIL ALL ITEMS ARE READ).

- No formal education requirements -----1
- Completion of high school or equivalency-----2
- Certification or Associates Degree-----3
- Bachelor's Degree (B.A., B.S.)-----4
- Professional or Graduate Degree  
(M.S, Ph.D., J.D., MBA, P.E.)----- 5
- DK/NA (Don't Read) -----6

Education Requirements	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
A. Occupation #1 -----	1	2	3	4	5	6
B. Occupation #2 -----	1	2	3	4	5	6
C. Occupation #3 -----	1	2	3	4	5	6
D. Occupation #4 -----	1	2	3	4	5	6

26. What is the typical pay range for each occupation, from entry level to most experienced employees in that occupation? [After each response to the pay range, please clarify whether the intended response was for hourly, monthly, or annual salary]

<b>PAY RANGE</b>	<b><u>Low</u></b>	<b><u>High</u></b>	<b><u>Salary Type</u></b>
A. Occupation #1	###	###	H, M, or A
B. Occupation #2	###	###	H, M, or A
C. Occupation #3	###	###	H, M, or A
D. Occupation #4	###	###	H, M, or A

+++++

**(Questions 27 and 28 are a loop to be repeated for each of the occupations selected for previous question set Q18-26)**

Ok, for the next few questions, please answer for the: \_\_\_\_\_ (READ OCCUPATION) occupation.

27. I'm going to read a list of general skills. Please tell me which one of these skills are **most important** when considering applicants for \_\_\_\_\_ (READ OCCUPATION)?

**Randomize**

- A. Technical competence specific to the position -----1
- B. Interpersonal and communication skills ----2
- C. Conscientious work ethic and positive attitude -----3
- D. Ability to work independently-----4
- E. Ability to follow directions -----5
- F. Creative problem-solving skills -----6

Important Skills	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
A. Occupation #1 -----	1	2	3	4	5	6
B. Occupation #2 -----	1	2	3	4	5	6
C. Occupation #3 -----	1	2	3	4	5	6
D. Occupation #4 -----	1	2	3	4	5	6

28. I'm going to read the same list of general skills once more. Please tell me which of these skills, your \_\_\_\_\_ (READ OCCUPATION) are currently **most deficient** in?

**Follow same order as given in Q27.**

- A. Technical competence specific to the position -----1
- B. Interpersonal and communication skills ----2
- C. Conscientious work ethic and positive attitude -----3
- D. Ability to work independently-----4
- E. Ability to follow directions -----5
- F. Creative problem-solving skills -----6

Deficient Skills	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
A. Occupation #1 -----	1	2	3	4	5	6
B. Occupation #2 -----	1	2	3	4	5	6
C. Occupation #3 -----	1	2	3	4	5	6
D. Occupation #4 -----	1	2	3	4	5	6

29. Lastly, we would like to know which occupations successful candidates for \_\_\_\_\_ (READ OCCUPATION) usually have before they become \_\_\_\_\_ (READ OCCUPATION) (INDICATE ALL THAT APPLY).

Occupations: -----  
(DON'T READ) Don't know-----98  
(DON'T READ) Refused -----99

30. And which occupations do current \_\_\_\_\_ (READ OCCUPATION) usually move onto after working successfully as a \_\_\_\_\_ (READ OCCUPATION) (INDICATE ALL THAT APPLY).

Occupations: -----  
(DON'T READ) Don't know-----98  
(DON'T READ) Refused -----99

---

---

We've completed all the questions about occupations. Before we finish, I'd like to verify your contact information so we can enter you in the lottery.

Please verify for us your company information.

D1a Company name \_\_\_\_\_  
D1b Company address (include City and Zip) \_\_\_\_\_  
D1c Web address \_\_\_\_\_  
D1d Fax number \_\_\_\_\_

Please verify for us your personal information, so we can enter you into the lottery for the \$1,000 cash prize.

D2a Name \_\_\_\_\_  
D2b Title \_\_\_\_\_  
D2c E-Mail \_\_\_\_\_



**GODBE RESEARCH**  
Gain Insight

GODBE RESEARCH

[www.godberesearch.com](http://www.godberesearch.com)

60 Stone Pine Road  
Half Moon Bay, CA 94019-1739  
Phone. 650.712.3137  
Fax. 650.712.3131

445 South Figueroa Street, Suite 2600  
Los Angeles, CA 90071-1631  
Phone. 213.624.8863  
Fax. 213.624.8864

785 Grand Avenue, Suite 200  
Carlsbad, CA 92008-2370  
Phone. 760.730.2941  
Fax. 760.720.4706