INFORMATION SYSTEMS AND TECHNOLOGY EMPLOYEE CHARACTERISTICS IN A TRANSITION JOB MARKET

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ABSTRACT

This paper reports on a study of information systems and technology hiring practices in the greater Denver metropolitan area. It investigated whether companies looked for the same things when hiring an employee as when they were laying off employees. This paper concludes that although there are some inherent differences, employers appear to rank these characteristics the same for both decisions.

INTRODUCTION

The Greater Metro Denver Area is a 130-mile geographic strip bounded on the north by Fort Collins and on the south by Colorado Springs, lying on a plain at the base of the Rocky Mountains. In the 1990s the state government and business community actively recruited new telecommunications and information technology businesses to expand its already appreciable investment in this economic sector. The phenomenal success of this endeavor to replace its historical reliance on the extractive industries with hi-tech industries resulted in a regional prosperity that was the envy of most of the rest of the nation. The regional prosperity that was built on the IS/T bubble of the late 1990s dissipated pretty rapidly when that bubble burst in the year 2001. Because the regional economy had become so dependent on the high-tech industries, the recession hit harder than in most of the country. The recovery was slower as well, because of this reliance on high-tech industries, and further exacerbated because most of the high-tech operations in this region were satellite operations rather than headquarter operations.

The recent recession in the IS/T industry was unprecedented. Although there was a severe downturn in the enrollments in IS/T undergraduate programs in the late 1980s, there was no coincidental downturn in the job market at that time [2]. Indeed, the IS/T industry appears to have been in a continuous growth cycle since the 1960s. The outsourcing and off-shoring of IS/T jobs also continues to be a deep concern of IS/T professionals as well as students considering careers in the field.

RESEARCH QUESTIONS

The academic program which employs the authors has seen a dramatic drop in enrollment over the past four years, similar to what has occurred in most IS/T programs across the country. While enrollments appear to be leveling off and even on the upswing, the authors of this paper decided it was critical to try to find out what skills/factors an employer looks for when initially hiring an IS/T professional, and what

skills/factors were considered when determining which employees to retain when layoffs occurred. In the fall of 2004 the authors realized that the transition period from recession into recovery presented a unique opportunity to learn about this issue. The authors were specifically interested in addressing the following research questions:

- What do employers look for when hiring new career employees?
- What do employers look for when retaining current employees in face of a reduction in workforce?
- Do employers treat these characteristics the same way when retaining as they do for hiring?

METHODOLOGY

The instrument was a questionnaire which consisted of a page of identification and demographic questions, followed by two pages of questions concerning "Information Systems/Information Technology Employee Characteristics." These latter two pages contained parallel items which the respondents were asked to evaluate on a three point scale (0 = not important, 1 = moderately important , 2 = very important) with respect to their *importance* when: A) *Hiring* New Career Employees, and B) *Retaining* Career Employees. These items were grouped into the following six general categories:

1. Proficiency in an area of specialty
2. Educational level
3. Work experience in the field
4. Certifications (MCSE, ICCP, etc.)
5. Competent communication skills
6. Evidence of team qualities

The instrument went through several iterations of development and pilot testing using members of the program's business advisory board who provided feedback regarding readability, understandability, and value of the content. The questionnaire was mailed to approximately 4,500 businesses in the Greater Denver Metro Area in early January 2005, addressed to the Information Technology Manager.   Usable responses were received from 216 persons yielding a response rate of 4.8%. Demographic data was obtained for size of respondent's organization (total annual revenue), type of business, and size of IS operation (number of IS employees). The authors believe that the resulting frequency distributions reasonably reflect the character of businesses in the greater Denver area.

ANALYSIS AND RESULTS

The data were analyzed using MicroSoft Excel, SPSS/PC for Windows, and Minitab. The techniques of frequency analysis, correlation analysis, t-tests for paired comparisons, and non-parametric comparisons were employed [1] [10]. Two of the demographic items directly addressed the issue of employee turnover. The first of these items asked "approximately how many employees did you *hire* in the Information Systems area in the last year?" There were 208 responses to this question, of which 89 indicated they had hired no one at all. The average number of hires per response was 2.4. The second of these items asked "approximately how many employees did you *lay off* in the Information Systems area in the last year?" There were 207 responses to this question, of which 175 indicated they had laid off no one at all. The average number of layoffs per response was 0.5. The correlation between these two items was assessed and yielded a Pearson coefficient of +0.315 with a p-value of 0.000. This indicates that to a significant degree the companies that indicated they hired new employees during the previous year also indicated they laid off existing employees during the same period. A t-test for paired

comparisons indicated that the average number of employees hired was significantly higher than the average number laid off during this period, with a p-value of 0.000.

The results of the data analysis to address the research questions are summarized in Table 1. Overall mean values for each of the major items were calculated. The items are listed in the table in the rank order of the mean values for the importance of the item in making *hiring* decisions. Five of the six items have mean values above 1.0, which would indicate they are all fairly important criteria used in *hiring* decisions. The last item (4. Certifications) has a mean value distinctly less than 1.0, which would indicate that it is not a very important consideration in the hiring decisions of most companies.

Table 1. Importance of General Item Categories									
Item	**Hiring Decisions**			**Retention Decisions**				**p-values**	
	Mean	**S.D.**	**Rank**	**Mean**	**S.D.**	**Rank**	**Wilcoxon**		**t-test**
5. Competent communication skills	1.79		0.41		1	1.79	0.45	2	0.796	0.798
6. Evidence of team qualities	1.68		0.53		2	1.80	0.46	1	0.000	0.000
1. Proficiency in an area of specialty	1.61		0.52		3	1.71	0.54	3	0.002	0.002
3. Work experience in the field	1.56		0.55		4	1.35	0.77	4	0.004	0.005
2. Educational level	1.38		0.50		5	1.04	0.71	5	0.000	0.000
4. Certifications (MCSE, ICCP, etc.)	0.74		0.66		6	0.69	0.69	6	0.086	0.083
Spearman rank correlation coefficient = 0.943, p-value = 0.005									

The mean values and their rankings for these items in *retention* decisions are remarkably similar to those for *hiring* decisions. With only one rank transposition, the ranks are the same. The significance of this was tested using a rank correlation test which yielded a Spearmans rho correlation coefficient of 0.943, which has a p-value of 0.005. The responses for the *hire/retain* pairs were compared for each of the six item pairs using two tests: 1) a t-test for paired comparisons and 2) a Wilcoxon signs test. The t-test is appropriate if it can be assumed that the responses are on an interval scale. It is a common practice in psychometrics to assume that Likert-like data as was used here can be treated as interval data (although that assumption is still somewhat controversial). The Wilcoxon test is a non-parametric test that is commonly used on ordinal data. The results that are shown in the two rightmost columns of Table 1 are remarkably similar. Items #1 (Proficiency in an area of specialty), #2 (Educational level), #3 (Work experience in the field), and #6 (Evidence of team qualities) show significant differences of the same magnitude regardless of which test was used. The difference is in the interpretation. The t-test permits a conclusion that the *means are different*, whereas the Wilcoxon test merely permits the conclusion that the *responses are different*.

REFERENCES

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