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An Empirical Investigation of Contingent Workforce in Information Systems

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INTRODUCTION

Since the recession in the 1980s, U.S. corporations have been strategically acquiring, merging, restructuring, and downsizing. Such strategic adjustments are aimed at configuring "leanandmean" operations in response to the increasingly dynamic, competitive and uncertain business climate (ScottMorton, 1991). A direct consequence of these radical changes to business operations is the revolutionary change in the traditional employer employee working relationship. Pfeffer and Baron (1988) suggest that there is a trend toward "taking the workers back out", in which organizations externalize a buffer of temporary workers against the core or permanent workforce. This externalization involves the use of contingent workforce where workers are physically transported out of the organization's boundaries to perform their work; where the duration of employment becomes shorter and more flexible; and where workers are detached administratively with organizations reducing their internal control of workers.

Recent literature suggests that externalization of the workforce has been particularly pronounced in information systems (IS). Many internal IS organizations have been undergoing continual downsizing of their traditional permanent workforce since the late 1980's by outsourcing and contracting (Niederman and Trower, 1993; Korzeniowski, 1990). Molloy (1991) highlighted an increasing number of temporary executive IS jobs while Ryan (1991) observed that jobless IS workers are turning to contract work to tide over their midcareer crisis. Clearly, these trends have significant implications for IS human resource management. For example, IS careers, incentive structures, and mutual employerworker obligations will be affected radically by an increasing presence and use of contingent workforce in organizations. However, despite the changing nature of IS employment options and the importance of IS human resource management (Niederman, Brancheau and Wetherbe, 1991), there has been little systematic analysis of the nature, extent and antecedents of externalizing IS human resources in organizations.

Our study is designed with two objectives: to provide an empirical analysis of actual trends in IS employment strategies and to derive an explanatory model predicting the choice of a particular IS employment strategy. Thus, the first set of issues examined

concerns the forms and trends of alternative employment strategies in IS. We examine the following questions:

- what are the hiring options opened to both employers and workers in IS ?
- what is the trend in alternative employment strategies in IS since the 1980s ?

We draw upon transaction cost economics to derive an explanatory model predicting the antecedents of IS employment strategies. The choice to use internal or external IS employment strategies can be framed as a classic "make or buy" decision of transaction cost economics, with respect to human capital inputs. Economists have often focused on costs inherent in various make or buy decisions. Coase (1937) originally theorized about the tradeoffs between transaction costs of external procurement and management costs of internal production. Demsetz (1988) argued that there are three different kinds of costs: production costs, exchange or transaction costs, and management costs inherent in any boundary outcome and that it is a combination of all three that is important in determining the make or buy decision.

Williamson (1981) shifted attention away from distinguishing transaction and management costs, as these costs are difficult to measure operationally. Instead, in the context of labor factor inputs, he focused on the presence of particular job characteristics such as firm specificity of skills, high interdependency, difficulty in monitorability, and task complexity, emphasizing the burden of management and transaction costs when jobs are externalized. In effect, these job characteristics offer proxy measures of transaction costs.

Thus, the second set of issues examined in this study concerns the kinds of considerations that play a role in boundary determination for IS labor. We examine the following questions:

- how do transaction costs determine IS labor boundaries ?
- what kinds of IS skill and job characteristics are associated with alternative employment strategies for IS labor ?

METHODOLOGY

We have chosen a longitudinal, content analysis of IS job advertisements to examine alternative employment strategies in IS. Job advertisements have been employed to study skills of IS personnel most recently by Todd, McKeen, and Gallupe (1995). A content analytic method has the advantage of being unobtrusive and enables making replicable and valid inferences from data in their context (Krippendorff, 1980). Job advertisements reveal not only the scale of IS labor demands but also the employment strategies that organizations are adopting and the corresponding skills sets and job positions they are seeking. Advertisements for IS jobs over a ten year period have been gathered from Computerworld. Computerworld was selected as it is the premier national trade journal in IS where IS job opportunities are widely advertised. To gather a sample of IS job advertisements, we have adopted a stratified sampling strategy in which advertisements

are sampled each quarter beginning July 1983, and ending June 1994. All advertisements appearing in the first week of each quarter have been sampled.

IS job advertisements have been coded for their respective employment strategies. The four alternative employment strategies: traditional employment versus three strategies of externalized, contingent work arrangement: placement agencies, contract services, and employee leasing, as they pertain to IS have been developed in Ang and Slaughter (1995), and empirically tested in Slaughter and Ang (1995). These strategies are based upon the types of administrative externalization in employment structures discussed by Pfeffer and Baron (1988). In addition to employment strategies, each job advertisement has also been coded for the type of position or IS job requested (e.g., programmer analyst; systems analysts; IS manager; etc.), prior work experience (years; industry); and skills inventory (e.g., type of operating systems, languages, network management, database management, etc.).

Two coders have coded the stratified samples for a decade of Computerworld job advertisements. As alternative employment strategies have not been explicitly categorized in the advertisements, trial samples have been used by coders to ensure sufficient intercoder reliability regarding the coding of employment strategies. The Cohen coefficient of agreement for nominal scales (Cohen, 1960) was computed to assess the relative agreement between the coders.

Because our variables for employment strategies, work experience, job position and skills inventory are categorical in nature, we have developed loglinear (logit) models to derive the correlates to the alternative employment strategies (Fox, 1984). We employ the logit model as a special case of the general log-linear form where the employment strategy variable is dichotomous (traditional in-house versus externalized forms) and is treated as a dependent variable, and the explanatory correlates (job position, work experience, skills) are independent variables (Aldrich and Nelson, 1984). Our estimation technique models cell frequencies using the multinomial response model and produces maximum likelihood estimates of parameters by means of the Newton-Raphson algorithm (Haberman, 1978).

PRELIMINARY RESULTS

We conducted a number of analyses to explore our research questions. First, we estimated a saturated logit model to assess significant trends in employment structures. Our results suggest that externalized employment strategies are significantly more prevalent in the period from 1989-1994, and that traditional in-house employment is significantly more prevalent in the 1983-1988 period. We then estimated a non-saturated logit model to determine the IS skill and job characteristics associated with alternative employment strategies. Consistent with a transaction cost perspective, our results suggest that choice of employment structure is significantly associated with industry type, job position, amount of work experience, and skills in certain kinds of operating systems and programming languages. One interesting result is that skills in Assembler languages, 4th generation languages, and Unix operating systems are significantly associated with

externalized employment structures, suggesting that relatively scarce skills are outsourced. Another intriguing result is that certain types of jobs (analysts, programmers, engineers and consultants) are significantly associated with externalized employment strategies while other jobs that are more firm-specific (e.g., telecommunications and network related positions) are significantly associated with in-house employment.

IMPLICATIONS AND CONTRIBUTIONS

Our study has the potential for important and interesting contributions relating to IS human resource management. Preliminary results suggest a significant and increasing trend in the use of external workers in IS. This implies that future studies of IS personnel should examine IS human resource strategies for managing external as well as internal workers. Our work can also provide insight into the antecedents of employment strategy choice. Preliminary results are consistent with a transaction cost perspective, and suggest that certain IS skills and jobs are associated with external employment strategies and other IS skills and jobs are associated with the traditional form of in-house employment. Finally, our study can serve as the basis for future research in this area, such as examining the consequences and implications of employment strategy choice for organizational performance.

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- complete references are available upon request -