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Service Management and Employment Systems In U.S. and Indian Call Centers

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Abstract

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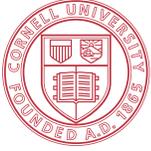
Keywords

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This paper has not undergone formal review or approval of the faculty of the ILR School. It is intended to make results of Center research available to others interested in preliminary form to encourage discussion and suggestions.

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Abstract

In this chapter, we draw on a comparative international survey of management strategies and employment practices in U.S. and Indian customer contact call centers. We compare these practices across three types of centers: U.S. in-house, U.S. outsourced, and Indian outsourced- offshore operations. We consider two questions. First, how similar or different are call center management strategies and employment systems in each type of establishment? Second, what are the implications of variation in management practices for outcomes such as turnover, which is a major problem for service quality and productivity in the industry. We find that U.S in-house centers tend to adopt a more professional approach to service management, while U.S. outsourced centers adopt the most cost-driven approaches. Indian offshore operations represent a contradictory pattern of management practices, with the use of a highly educated workforce, but with highly standardized work processes that lead to under-utilization of human capital. Both U.S. and Indian subcontractors experience high turnover rates, compared to U.S. in-house locations, and these are explained by the high levels of scripting and standardized processes found in these worksites. We conclude with a discussion of policy implications.

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Service Management and Employment Systems in U.S. and Indian Call Centers¹

The explosive growth of call centers in India has gained widespread attention because of its potential impact on employment in the United States and other advanced economies. Media accounts report that Indian operations are more likely to use college educated workers while paying one-tenth of U.S. wages. Some argue that these advantages may allow Indian centers to outcompete U.S. centers on both cost and quality (Dossani & Kenney, 2004). Nonetheless, complaints of poor quality and security, as well as consumer backlash have led some firms to pull out of India while leaders in the offshoring business like GE have sold their Indian operations all together. High turnover rates have become a particularly serious problem in recent years as an expanding number of employers compete for a small pool of educated employees – a trend that both increases costs and undermines service quality.

Our understanding of this emerging sector, however, is based largely on anecdotal evidence, with more heated debate than systematic empirical investigation. Even national figures on employment, industry trends, and the percent of centers that are operated in-house (as opposed to outsourced or offshore) are unreliable². In addition, there has been little or no research on management and employment practices in this sector -- either in the U.S. or in India. In this paper, therefore, we consider two questions. First, how similar or different are call center management strategies and employment systems in each country? Here, our goal is to map the management practices adopted across three types of operations: in-house centers in the U.S., outsourced centers in the U.S., and outsourced-offshore centers in India. By outsourced-offshore, we mean establishments that are owned and operated by subcontractors in India and serve the U.S. market (we refer to these as 'offshore' throughout the paper). Is there systematic variation in these practices or is there a call center 'production model' that has diffused across very different institutional and organizational contexts? Second, what are the implications of variation in management practices for outcomes such as turnover? In other

words, which practices explain the high levels of turnover in the industry?

To answer these questions, we draw on an original establishment level survey of 330 call centers in the U.S. and India. We focus on customer contact rather than back office operations such as check processing or on-line order fulfillment. For each center, the survey provides information on the customer base, market and ownership conditions, organizational characteristics, work functions, workforce skills and training, call center technology, work organization, compensation, and outcomes such as absenteeism and turnover. In the next section, we discuss prior research that informs our study, and in section three we present the study methods and analytic strategy. Section four discusses our findings, and the final section outlines the study's limitations and implications for policy.

Prior Research

A first question in this study concerns the extent to which call center management practices vary across different markets and institutional settings. Call centers represent a new industrial model driven by advances in information technologies that are now ubiquitous. Call center technologies facilitate the automation of services through interactive voice recognition units, standardize customer transactions through skill-based routing systems, create machine-paced operations through automated call distribution systems, and routinize work through widespread use of scripting and electronic monitoring

However, research shows that service management strategies and employment systems vary substantially across centers serving different industries, customer segments, and work functions – from professional approaches to service to highly transactional or cost-driven ones (Frenkel, Tam, Korczynski, & Shire, 1998; Batt, 2000; Shire, Holtgrewe, & Kerst, 2002). In this line of research, work and employment systems typically are defined to include three dimensions: a) the level of education and training required; b) the level of discretion and collaborative problem-solving embedded in the design of work; and c) the level and type of compensation system designed to motivate effort (Appelbaum, Bailey, Berg, & Kalleberg, 2000;

Batt, 2002).

The professional service model includes a set of employment practices based on high relative skills and training, employee discretion and collaborative problem solving, and high relative pay (Batt, 2002; Heskett, Sasser, & Schlesinger, 1997). This approach to service management is typically found in business-to-business centers and IT help desks or technical service centers. By contrast, centers that focus on simple transactions, such as telemarketing, reservations, or credit card handling, require relatively low skills, and jobs are likely to be highly routinized with low pay. Quality control is ensured through extensive use of electronic monitoring systems (Heskett et al., 1997).

A more complex question is how to explain the variation in customer contact centers that fall between these two extremes: centers that target the mass market or a mixture of markets and that provide service and sales for products that entail some degree of complexity along with opportunities to bundle services and customize offerings. These represent the overwhelming majority of contact centers, serving customers in such sectors as financial services, insurance, telecommunications, and a variety of manufacturing industries. Here, management strategies vary considerably in how much weight they give to competing on quality and mass customization (Pine, 1993) versus focusing primarily on cost.

In-house versus Outsourced Strategies

How does this variation in call center management strategies and employment systems map on to their ownership status – that is, whether they remain as in-house operations, are outsourced, or sent offshore? There are many reasons to believe that outsourced and offshore centers will adopt management strategies that focus more on controlling costs than investing in employees. First, outsourcing allows firms to avoid paying the high wages associated with internal equity norms and internal labor markets (Abraham, 1990) or union contracts (Pfeffer & Baron, 1988). Several studies have found that subcontractors hire workers at lower pay and benefits to do the same work (Davis-Blake & Uzzi, 1993). Erickcek, Houseman and Kalleberg

(2003) found that this is particularly true for low-skilled work, where subcontracting led to the loss of union representation as well as lower pay and benefits.

Second, the literature on transaction cost economics suggests that outsourced centers will focus on cost reduction because, as work is turned over to a third-party, the client firm must absorb the costs of monitoring and contract enforcement (Williamson, 1985). Thus, client firms are likely to exert great pressure on subcontractors to keep costs low in order to justify the additional transaction costs of managing the vendor relationship. In addition, client firms worry about the operational risks associated with third-party subcontracting; and as a result, are likely to outsource those processes that are easily standardized or codified and monitored through objective performance metrics. As research by Ravi Aron in this volume (chapter XX) shows that the more work processes are codified and the higher the number of performance metrics agreed upon by the buyer and seller, the lower the operational risk. Other research also demonstrates that subcontractors drive efficiency through greater work intensity and capital utilization, compared to in-house operations (Marsden, 1999). In a recent study, Grugulis, Vincent, and Hebson (2003) examined outsourcing in three functions requiring radically different levels of skill and complexity, and found that in each case the process of subcontracting led to higher levels of employee monitoring, adherence to specific performance metrics, and lower levels of employee discretion.

In the call center industry these issues are likely to be particularly salient because “arms length” contracting and attention to the bottom line are widespread, and contract enforcement typically is ensured through on-going monitoring and adherence to performance metrics (Kinnie & Parsons, 2004). Performance management technologies such as electronic monitoring systems provide real-time measures of talk times, adherence to schedules and scripted texts, and sales productivity, allowing client companies to regularly monitor the employees of subcontractors. Thus, subcontractors are under intense pressure to contain costs and meet these efficiency goals.

The work of Levy and Murnane (2002) on computers, skills, and the organization of work provides additional insights into the process of subcontracting. They have argued persuasively that computers are best able to automate jobs that require rules-based logic -- such as data management and order processing – precisely the kind of jobs frequently found in call centers. Automation does not eliminate all jobs, but creates standardized work processes that reduce operational risk and allow electronic monitoring of a wide range of performance metrics. Once these processes are computerized and standardized, they are more easily outsourced to third party vendors. However, more complex processes with higher levels of uncertainty are more likely to be retained in-house, where companies have direct control over operations that require more tacit knowledge and entail more nuanced interactions with customers.

The strategic management literature on core competencies (Prahalad & Hamel, 1990; Quinn, 1992) provides another perspective on how and why outsourced work systems are likely to be more cost focused and standardized than those managed in-house. In theory, firms should retain functions that they consider to be their core competency while outsourcing those functions that are non-core. Core capabilities are defined as those that contribute value to customer benefits and end products, that provide access to a wide variety of markets, and that are difficult for competitors to imitate (Prahalad et al., 1990). When applied to the choice of employment systems, the theory suggests that firms should retain human capital that creates value for the firm and is rare or unique and difficult to imitate (Barney, 1991; Williamson, 1981). For example, firms are likely to choose internal employment systems for operations that involve firm specific knowledge and skills, team-based systems, or work processes that involve “social complexity”, “causal ambiguity”, or “idiosyncratic learning” (Lepak & Snell, 1999: 35). They are likely to externalize or subcontract work that is more generic, involves lower order skills, or is transactional in nature. Much call center work appears to fall into this latter category, and thus would be viewed as a prime candidate for outsourcing.

According to this argument, whether call center work is outsourced or not depends on

whether customer relationship management is considered a core competency or central to a firm's competitiveness. If the products and services offered by a company are relatively complex, involving firm-specific knowledge of products, processes, or customers, then firms are likely to retain their customer service and sales functions in-house. Similarly, if companies seek to compete on quality service or customer loyalty, they are also likely to keep call center work in-house because they do not want to lose control of their customer base or have their customers treated generically – in the same fashion as the customers of their competitors – who may be using the same call center subcontractor.

For high value added customers, such as business customers, firms are particularly likely to use a strategy of service quality, customization, and loyalty (Batt, 2000) and therefore retain business-to-business channels in-house. For mass market service channels, the costs and benefits of keeping operations in-house or not is a more ambiguous question from a strategy perspective; and there appears to be considerable variation in what companies actually do. While call center subcontractors grew dramatically in the 1990s in the U.S. (2001; Datamonitor, 2003), at least eighty-five percent of contact centers in this country continue to be in-house operations (Batt, Doellgast, & Kwon, 2004; Datamonitor, 2001). This would suggest that a large majority of firms view their customer service and sales operations as central to their competitiveness -- or at least have not yet become convinced that they should outsource them.

The implications of these arguments for the design of work and employment systems are quite straight forward. Companies are more likely to retain in-house services that are more complex, that involve customer transactions that are more nuanced or uncertain, and that provide services to higher-valued customers. In order to meet the demands of these types of products and customers, they are more likely to use a strategy of service quality and customization, and therefore, to adopt a more professional approach to service compared to subcontractors. Centers that are operated by subcontractors, either in the U.S. or offshore, by contrast, are more likely to compete on costs through lower wages and benefits, more

standardized work processes, and higher levels of performance monitoring.

Outsourced versus Outsourced-Offshore Strategies

The academic literature provides much less guidance for predicting the differences between U.S. outsourced and offshore centers in India. On the one hand, arguments regarding the likelihood of a more cost-based strategy in outsourced operations may be equally or more relevant to offshore subcontractors. U.S. companies have sent work overseas to take advantage of lower wages, but at the same time, they are concerned about the level of service quality provided. They also worry about consumer backlash and the security and privacy of financial databases. A recent survey of U.S. executives reported that the top driver for moving operations offshore was cost savings, while the top reasons for staying onshore were security and service quality issues (Ventoro, 2005).

For these reasons, U.S. companies may impose tighter constraints on managerial discretion in Indian centers and higher levels of performance monitoring and adherence to call center metrics. If so, then we would expect the work and employment systems in Indian call centers to be more tightly constrained and standardized than those found among U.S. subcontractors.

On the other hand, unique conditions in the Indian labor market suggest that both the reasons for moving work to this segment and the incentives for investing in employees may differ from those in the U.S. outsourced sector. First, the offshore workforce tends to be drawn from a relatively small pool of college educated, middle class Indians. We might expect these employees to be more self-motivated, allowing managers to rely on more professional, or at least quasi-professional, employment practices to motivate their workforce. Moreover, given the large cost advantages that Indian centers enjoy, there is opportunity to relax adherence to performance metrics such as talk time so that employees can use their skills and discretion to respond more effectively to customer requests.

In addition, the growing competition for these employees has put pressure on employers

to invest in a number of benefits intended to promote commitment and reduce turnover. Many call centers serving the international market occupy sprawling complexes outfitted with gyms and canteens. They often provide employees with free lunches and door-to-door taxi services and seek to create a “fun” environment with games and prizes. The additional investment in “accent neutralization” training required by many companies, which averages one to two weeks, makes it particularly costly to lose employees. Moreover, the use of fixed employment contracts in India also means that there is a long wait for new employees, which increases the expense of recruitment. One manager of a multinational third-party center explained:

You have to think about hiring way, way ahead because not only do you have to give 30 days notice, they have to give their previous employer 30 days notice before they leave you or leave someone else and come to you. Let's say I was trying to hire someone from another company in India, she has to give 30 days notice, so I have a delay for the 30 days. And once I get her, she has to do the normal products training, but she also goes through two and a half to three weeks of accent neutralization training. So there is a long, long wait for employees offshore. It's a month longer than in the U.S., easy. (March 2005).

In sum, the unique labor market conditions and cost advantages of Indian offshore centers suggest that they will adopt a less transactional approach to work and employment systems than subcontractors located in the U.S.

Management Practices and Turnover

The second question in this paper is how the different management strategies adopted across segments of the market translate into organizational outcomes. Empirical research on the performance effects of alternative approaches to service management has expanded in recent years. There is growing evidence that a more professional, or at least quasi-professional, approach is associated with higher employee satisfaction and customer satisfaction (Loveman, 1998), higher sales productivity (Batt, 1999), lower turnover and higher sales growth (Batt, 2002), and higher service quality and higher net revenues (Batt & Moynihan, 2004).

Low-cost systems, by contrast, typically are associated with high levels of employee dissatisfaction, absenteeism, and turnover; and these, in turn, often produce added costs and low service quality. For example, several studies of call center workers have found that routinized work design and high levels of electronic monitoring lead to stress, anxiety, depression, emotional exhaustion, and burnout (Carayon, 1993; Deery, Iverson, & Walsh, 2002; Holman, 2001; Holman, Chissick, & Totterdell, 2002; Singh, 2000). Deery et al. (2002) found that customer interactions, scripts, routinization, workloads, and managerial emphasis on quantity predicted emotional exhaustion, which in turn predicted absenteeism. Singh (2000) demonstrated that as worker burnout with customers increased, call center workers were able to maintain their productivity levels, but their self-reported quality was lower.

In this paper, we focus on turnover because it is extremely high in the industry and viewed as a major problem by employers. Industry analysts estimate that it averages between 30 and 70 percent in the U.S., but in our interviews, some managers reported rates of 100 to 150 percent annually. In India, news reports suggest that turnover rates are often 50 percent or higher. Voluntary turnover, or the employee quit rate, is of particular interest to organizational researchers as it represents a large cost to employers. When employees leave, their experience and the firm's investments in training are lost. Moreover, as noted above, the factors that influence turnover also influence other important outcomes, including employee motivation, service quality, and labor costs.

Empirical studies of voluntary turnover have found that it is significantly related to human resource practices (Arthur, 1994, Huselid 1995), particularly with respect to work design and compensation. In recent research, Shaw, Delery, Jenkins, & Gupta (1998) found that quit rates were lower when monitoring and work intensity were lower and pay and benefit levels were higher. Similarly, Batt, Colvin, and Keefe (2002) found that greater discretion and collaboration at work coupled with high relative pay predicted lower quit rates while high levels of electronic monitoring and use of commission-based pay led to higher quit rates.

Expected Findings

We have argued above that ownership status is likely to be associated with alternative approaches to work and employment practices. Based on the theoretical and empirical literature, we expect that in-house, outsourced, and offshore establishments will differ systematically in their service management and employment systems. Compared to outsourced or offshore centers, in-house establishments are likely to adopt employment practices that involve a higher educated and better trained workforce, that provide employees with more discretion and problem-solving capability, and that offer higher relative pay. We also expect differences between outsourced and offshore centers, with the latter likely to adopt a more professional approach to employment management than the former. These differences in choice of employment system, in turn, should explain variation in turnover rates, with the more professional approach associated with significantly lower turnover. In other words, work and employment practices should partially explain the relationship between ownership status and turnover. To examine these arguments, we developed a model of turnover that includes controls for market and organizational characteristics, while examining the independent variables of ownership status and employment system characteristics, as follows:

Turnover = f(market and organizational characteristics, ownership status, education and training, work organization, compensation strategy)

Methods

Sample

The sample for this study is based on two identical establishment-level surveys conducted in the U.S. and India between mid-2003 and mid-2004. The U.S. survey was administered to 472 call centers based on a stratified random sample drawn from the subscriber lists of *Call Center Magazine* (60 percent of the sample) and the Dun and Bradstreet listing of establishments in the telecommunications industry (40 percent of the sample). This was necessary to identify call centers in different industries. A survey team conducted the survey by telephone with 40 minute average interview, yielding a 65.4 percent response rate.

The Indian survey was administered to 60 call centers, based on a non-random sample of Indian call centers provided by the *National Association of Software and Service Companies* (NASCOM) in India. Surveys were conducted on site in six regions with large concentrations of call centers (Chennai, Kolkata, Bangalore, Bombay, Hyderabad, and Delhi) with an average interview time 95 minutes. Respondents in both surveys were asked to answer questions as they pertain to the “core” workforce in their establishment – the largest group of customer contact employees who carry out the primary work activity at that location.

Due to variation across the samples, we use a portion of the full dataset in this analysis. First, we restrict our sample to three market segments: large business, mass market, and all markets. We dropped 106 small business centers and 10 operator services centers from the U.S. sample, as these segments were not present in the Indian sample. Second, we excluded 16 call centers that serve only the Indian domestic market (located primarily in Kolkata), as it is only the international centers that serve the U.S. market. This resulted in a sample size of 392. Due to randomly-missing observations in the dataset, our regression analyses are based on a sample of 310 call centers (237 U.S. in-house, 42 U.S. outsourced, and 31 Indian offshore).

In both the U.S. and India, we conducted extensive site visits in different industry segments to aid with the design of the survey and interpretation of results. In the U.S., we visited 12 in-house call centers and six outsourced call centers, where we interviewed managers, supervisors, and employees on various aspects of their human resource policies and work design strategies. In India, each survey was administered on site, allowing the researcher to cross-check responses and providing an additional test of the reliability of survey responses.

Measures

The independent variables of interest include the ownership status of the center (in-house, outsourced, or offshore), and the work and employment system, as defined along three dimensions: human capital (employee education and training), work design (opportunities for discretion and problem-solving), and rewards (compensation practices). To determine whether

an establishment was in-house or outsourced in the U.S. sample, respondents were asked how they would best describe the call center: as an in-house center providing services to their company or as a subcontractor providing services to other companies. The offshore segment includes Indian call centers that serve an international market. Almost all of the Indian centers were owned and operated by Indian subcontractors, with only a handful owned by U.S. subsidiaries or U.S. subcontractors.

To measure human capital, we control for the sex composition of the workforce and use two measures of education and training: the years of formal education of the typical worker in the call center and employer investment in initial training (an additive index of the number of weeks of initial training an employee receives and the number of weeks to become qualified). For work design, three measures capture the extent to which employees have opportunities for discretion and problem solving. First, discretion over customer interactions is measured by the variable *script use*, based on a 1-5 Likert response to the question “to what extent are core employees required to use scripts when talking to a customer?” where 1 is “not at all” and 5 is “a great deal.” Second, we used three measures to construct a *work discretion index*, again based on 1-5 Likert-type questions. Respondents were asked to rate the extent to which core employees had discretion over their daily work tasks; tools, methods or procedures; and pace of work. The three measures were highly correlated ($p < .001$) and were combined into a mean index. The third measure of discretion, *percent in offline teams*, is the percentage of employees who participate with supervisors in problem solving groups or teams.

The final group of variables measure compensation practices, including total compensation and percent commission pay. We were unable to use average annual salary in the analysis due to the large difference in pay across the U.S. and India. While there are national statistics in the U.S. on average compensation for customer service and sales employees, it is difficult to find accurate information on the typical pay of a call center employee in India. We therefore constructed a *pay ratio* measure based on the ratio of a call center's

average gross annual pay to the median pay in each full country sample (\$29,000 in the U.S. and \$2,444 in India). Informal documentation from industry publications gave similar estimates for average pay levels in the Indian market. The U.S. median pay in our sample was also similar to estimates from the Bureau of Labor Statistics for the median pay of customer service representatives (\$28,720). *Percent commission pay* is measured as the percentage of total annual pay that is based on individual commission.

Dependent variable. The dependent variable of interest is the average annual quit rate, as reported by managers for the previous calendar year. A square root transformation was used to correct for the non-normal distribution of the variable.

Control variables. We included additional controls for common turnover determinants. The primary customer segment served by employees has been found in several previous studies of front-line service workplaces to influence both management practices and turnover rates (Batt, 2000, 2002; Keltner, 1998). Call centers serving higher value-added segments, such as large business customers, can be expected to invest more both in the skills of the workforce and in employee retention, as well as to be more selective in hiring, reducing quit rates. Call centers serving multiple market segments typically have a broader skill base and greater diversity in the job requirements. We thus control for whether the establishment serves primarily large business, mass market, or multiple market segments. We also control for union presence, which has been found in past studies to be negatively correlated with quit rates (Batt et al., 2002; Shaw, Delery, Jenkins, & Gupta, 1998). Employees in unionized establishments are able to exercise “voice” versus “exit”, improving pay and working conditions, and reducing turnover (Freeman & Medoff, 1984).

In earlier analyses, we tested the effects of several other control variables that have been used in past studies of turnover, including use of systematic selection procedures for hiring new employees, the ratio of applicants hired, whether the call center was part of a larger organization, and the age of the call center. We also analyzed variation in outcomes when

controls for industry and type of call center work were added, including a control for whether the call center predominantly handled sales versus customer service. None of these had a substantial effect on the coefficients of the independent variables of interest and either reduced or had a negligible effect on the overall Chi-square. Several of these additional controls were also highly correlated with other variables included in the model. For example, both the outsourced and offshore centers have significantly lower average age than in-house call centers. Thus, in the final model we included a more parsimonious list of control variables that captured key measures of markets and organizational characteristics.

Results

Table 1:
Mean Comparison: In-house, Outsourced, and Offshore Call Centers

	In-house	Outsourced	Offshore	ANOVA p < .05
Organizational characteristics				
Establishment age in years	15.7	9.4	3.4	a,b,c
Part of a larger organization	79.6	75.9	78.9	
% sales-oriented call centers	5.0	13.8	29.4	b
Call handle time in minutes	4.7	5.9	12.0	b,c
Workforce characteristics				
% female	68.9	71.5	43.1	b,c
% tenure less than 1 year	28.1	36.8	61.8	a,b,c
% part time	17.6	35.6	1.0	a,b,c
Training and qualification				
Average years education	13.3	12.6	14.0	a,b,c
% with typical education high school	38.3	69.0	36.4	a,c
Days of initial training	19.7	11.5	23.6	a,c
Days to become qualified	66.8	44.2	53.3	
Days of ongoing training per year	9.6	10.4	11.2	
Employee discretion				
Reliance on scripted texts*	9.9	48.3	32.4	a,b
Discretion over work*	9.9	3.4	5.9	
Discretion over handling customer requests*	39.2	17.2	2.9	a,b,c
% participating in offline teams	36.2	22.2	6.9	b,c
Performance Monitoring				
% work time electronically monitored	49.5	67.7	91.7	a,b,c
Frequency of supervisor monitoring**	49.7	67.9	82.4	b
Frequency feedback and coaching**	46.0	55.2	94.1	b,c
Compensation				
Average annual pay (\$)***	27,713	23,881	2,635	a,b,c
% pay based on commission	8.4	4.1	18.5	b,c
Turnover and Absenteeism				
% quit	15.8	25.6	24.5	a,b
% total turnover (quits + dismissals)	24.6	41.2	29.6	a,c
% absenteeism	5.5	8.9	5.3	a,c
Sample Size				
	181	29	34	

a in-house and outsourced are significantly different;

b in-house and offshore are significantly different;

c outsourced and offshore are significantly different

* Percentage answering "a lot" or "a great deal"

** Percentage with weekly to daily performance monitoring

*** Gross annual earnings

Comparison of Mean Characteristics

Table 1 presents a comparison of organizational characteristics, workforce characteristics, employment system variables, and organizational outcomes for the in-house, outsourced, and offshore centers. We use a broader range of variables here than were included in our analysis of turnover antecedents to provide a more comprehensive picture of how organizational characteristics and management practices differ across the segments. In addition, in order to make comparisons more precise, we restricted the mean comparison in Table 1 to non-union call centers serving mass market or multiple customer segments.

We tested the significance of mean differences using one-way analysis of variance. In general, there are significant differences in most dimensions of organizational characteristics and work and employment systems across the three types of centers. The patterns are consistent with our expectations, but there are important exceptions and contradictory patterns as well. Overall, in-house centers tend to adopt a quasi-professional approach to employment compared to either outsourced or offshore centers. They offer jobs with substantially more opportunities for discretion and problem solving, make significantly less use of electronic monitoring and performance management systems, offer higher pay and rely less on commission pay. Associated with these patterns are significantly higher rates of organizational tenure and lower turnover rates than those found in either outsourced or offshore centers. For example, while 28 percent of the workforce in U.S. in-house centers has less than 1 year of tenure, the comparable rates in outsourced centers are 37 percent, and in offshore centers, 62 percent. Annual employee quits alone are reported at 16 percent in in-house centers, but 26 percent in outsourced, and 25 percent in offshore sites – that is, over 55 percent higher than the in-house centers.

The exception to this pattern is that offshore centers rely on a workforce with somewhat higher formal education than those in in-house locations. The typical worker in an Indian center has 14 years of education (on average 2 years of college) compared to 13.3 years among U.S.

in-house establishments. Yet these differences are not as great as often portrayed in the media. Close to 40 percent of managers in both types of centers (38 percent in-house and 36 percent offshore) reported that the typical worker in their establishment is high school educated. Similar patterns hold for initial training, with offshore call centers providing 4.7 weeks on average, and in-house centers, 3.9 weeks. However, given that much of the initial training in Indian centers is focused on accent neutralization, it appears that Indian centers do not provide more initial training for other aspects of the job.

The differences between U.S. outsourced and Indian offshore centers are more contradictory. The formal education levels of Indian centers are substantially higher than those found among U.S. subcontractors, where the typical worker has an average education of 12.6 years and almost 70 percent of managers report that the typical worker has a high school diploma only. Initial training in U.S. outsourced centers is less than half that found in Indian centers. However, the amount of on-the-job training to become qualified and the annual rates of on-going training are not substantially different.

However, despite relying on a more educated and full-time workforce, the Indian centers have work systems that are more tightly constrained and standardized than those found among U.S. subcontractors, contrary to our expectations. With the exception of reliance on scripts, which is higher in the U.S. outsourced centers, Indian managers report substantially lower levels of discretion over handling customer requests and use of problem solving groups. For example, only 3 percent of offshore call centers report giving employees “a lot” or “a great deal” of discretion in handling customer requests, compared to 17 percent of outsourced centers and 39 percent of in-house centers. While in-house centers have an average of 36 percent of employees participating in teams, 22 percent of employees in outsourced centers and only 7 percent of those in offshore centers participate.

Measures of performance monitoring illustrate a similar pattern. Most call centers adopt a mix of practices to track employee performance on adherence to talk time, whether they follow

the scripts provided, and their effectiveness in both providing friendly service and resolving customer requests. In a sales environment, monitoring is also used to both control potential employee fraud and provide coaching on selling techniques. Both electronic monitoring and supervisor monitoring and feedback are employed for this purpose, and the intensity of these practices varies substantially across the different sites. While about 50 percent of work time in in-house centers is electronically monitored, this average jumps to 68 percent in outsourced centers and 92 percent in offshore centers. Similarly, supervisors provide feedback and coaching on a weekly or daily basis in 94 percent of the offshore centers, compared to much lower levels (46 and 55 percent) in the U.S. in-house and outsourced segments.

With respect to compensation, the average median annual pay reported by managers is \$27,713 among in-house centers, \$23,881 in outsourced centers, and \$2,635 in offshore centers. Thus, in-house centers pay about 14 percent more than do outsourced centers, and 90 percent more than the offshore segment. The use of commission pay is surprisingly low across the in-house and outsourced segments, at 8 and 4 percent, but significantly higher in offshore centers at 19 percent. This probably reflects the higher percentage of sales oriented call centers in the offshore sample (29 percent), compared to the in-house (5 percent) and outsourced (14 percent) sites.

Finally, we compare turnover and absenteeism – both important organizational outcomes. High investments in training at many workplaces mean that turnover is costly, and the often tight scheduling practices based on predicted fluctuations in call volume mean that excessive absenteeism has an immediate negative effect on customer satisfaction and sales. As indicated above, quit rates as well as total turnover are the lowest among in-house centers and higher in outsourced and offshore centers. Absenteeism, by contrast, is highest in the outsourced segment (9 percent) and lower in both in-house and offshore centers (6 percent and 5 percent respectively). These measures capture the motivation of the workforce to show up and meet performance expectations, and are largely in line with our other results that indicate

outsourced centers tend to adopt a low-commitment employment system that combines low pay with intensive monitoring and low discretion.

Due to variation in the industries represented in each sample, we checked to see whether these patterns held when the sample was further broken down. For example, we compared centers serving high end customers as well as those in telecommunications and financial services and found similar patterns. That is, no particular sectors accounted for the variation found across in-house, outsourced, and offshore sites.

Table 2: Means, Standard Deviation, and Pairwise Correlations^a

Variable	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Sqrt annual quit rate	3.23	2.22															
2 Large business segment	0.34	0.47	-0.16														
3 Multiple market segments	0.19	0.40	0.02	-0.35													
4 Mass market segment	0.47	0.50	0.13	-0.67	-0.46												
5 Union presence	0.08	0.27	-0.22	0.00	-0.05	0.04											
6 Inhouse	0.76	0.42	-0.27	-0.04	-0.04	0.06	0.13										
7 Outsourced	0.14	0.34	0.13	0.12	-0.12	-0.01	-0.08	-0.71									
8 Offshore	0.10	0.30	0.24	-0.08	0.19	-0.08	-0.10	-0.60	-0.13								
9 Percent female	0.64	0.25	0.08	-0.25	-0.04	0.27	0.24	0.11	0.12	-0.30							
10 Years education	13.53	1.64	-0.19	0.21	0.01	-0.21	-0.06	0.07	-0.19	0.12	-0.46						
11 Initial training investment	19.01	17.73	-0.23	0.06	0.00	-0.05	0.22	0.17	-0.15	-0.07	-0.04	0.06					
12 Script use	2.19	1.20	0.27	-0.03	0.03	0.01	-0.01	-0.43	0.26	0.31	0.07	-0.18	-0.17				
13 Work discretion index	2.60	0.92	-0.37	0.15	0.07	-0.19	-0.01	0.23	-0.09	-0.22	-0.16	0.24	0.04	-0.29			
14 Percent in offline teams	0.36	0.38	-0.36	0.17	-0.05	-0.12	-0.01	0.27	-0.12	-0.25	-0.18	0.19	0.15	-0.16	0.25		
15 Pay ratio	1.19	0.60	-0.31	0.44	-0.11	-0.33	0.09	0.17	-0.16	-0.05	-0.46	0.50	0.30	-0.20	0.33	0.26	
16 Percent commission pay	0.11	0.20	0.04	0.11	-0.02	-0.09	-0.13	-0.05	-0.05	0.13	-0.29	0.08	0.08	-0.05	0.14	-0.04	0.39

^a For all correlations greater than .11, $p < .05$

Table 3: Tobit Estimates for Quit Rates^a

Variable	Model 1		Model 2		Model 3		Model 4	
	Coeff	St. Error						
Organizational & Market Characteristics								
Large business segment	-1.02 ***	0.31	-0.61 +	0.32	-0.32	0.30	-0.17	0.31
Multiple market segments	-0.62 +	0.38	-0.50	0.37	-0.21	0.35	-0.20	0.34
Union presence	-1.99 ***	0.54	-2.02 ***	0.55	-2.15 ***	0.51	-1.91 ***	0.52
Outsourced	1.22 ***	0.41	0.78 +	0.41	0.19	0.39	0.15	0.39
Offshore	2.03 ***	0.47	2.30 ***	0.48	0.57	0.50	0.40	0.50
Human Capital								
Workforce: % female			1.10 +	0.68	0.22	0.64	0.19	0.67
Years of education			-0.20 *	0.09	-0.06	0.09	0.01	0.09
Initial training investment			-0.02 *	0.01	-0.01 +	0.01	-0.01 +	0.01
Work Design								
Script use					0.22 +	0.12	0.23 *	0.12
Work discretion index					-0.73 ***	0.15	-0.73 ***	0.15
Percent in offline teams					-1.84 ***	0.37	-1.74 ***	0.37
Compensation Strategy								
Pay ratio							-0.52 +	0.32
Percent commission pay							1.47 *	0.71
Constant	2.27		5.47		6.28		5.70	
Sample size	310		310		310		310	
Chi square likelihood ratio	50.02		67.73		124.89		130.05	
Probability > Chi square	0.00		0.00		0.00		0.00	
Pseudo R ²	0.04		0.05		0.09		0.10	

^a Unstandardized Tobit estimates are reported

+ = p<.10; * = p<.05; ** = p<.01; *** = p<.001

Multivariate Analyses

Table 2 provides the means, standard deviations, and pairwise correlations of the variables included in the final model. For our analyses of turnover, we estimate left-censored Tobit models because the dependent variable is truncated at zero (Maddala, 1992).

Predictors of turnover. Table 3 reports estimates of models for quit rates at the establishments. The first equation, model 1, includes the market segment and organizational characteristics. The second equation adds controls for employee human capital, while the third and fourth add measures of work organization and compensation practices.

In the first model, after controlling for market segment, outsourced and offshore centers have significantly higher quit rates (compared to the omitted variable, in-house centers), while unionized centers are associated with significantly lower quits.

In model 2, both the length of initial training investment and years of education are significantly associated with lower quit rates. The percent of the workforce that is female is positively associated with higher quits, but this relationship becomes insignificant in the full model. Offshore ownership status continues to be positive and significant at the $p < .001$ level, while the significance of outsourced status decreases but is still marginally significant. With the introduction of work design variables in model 3, neither outsourced nor offshore status remains significant, and human capital variables decline in significance. Work discretion and the use of problem-solving groups are significantly negatively associated with quit rates ($p < .000$), while script use is positively associated ($p < .10$). In the full model (4), union presence, training investments, work discretion, use of problem-solving groups, and the pay ratio are all significantly associated with lower quit rates, while script use and percent commission pay are associated with higher quits.

We estimated the effect sizes of the Tobit coefficients by decomposing them into estimates of changes in outcomes above the left censored limit and changes in the probability of observing an outcome above the left limit (McDonald & Moffitt, 1980). This provides an

interpretation equivalent to OLS estimates.³ The Tobit coefficients in the model are 0.62 of the OLS coefficients. Thus, when the work discretion index changes by one-standard-deviation, the effect on quit rates decreases by 0.5 percentage points (0.62×-0.73); while a one-standard-deviation increase in the percent of employees who participate in offline teams decreases the effect on quits by 1.1 percentage points ($p < .001$).

Discussion, Limitations, and Policy Implications

In this study we examined the extent of variation in service management and employment strategies among in-house, outsourced, and offshore call centers that provide similar services to U.S. customers. We found significant differences in the patterns of employment practices and related outcomes across these three settings, but not in ways that were entirely anticipated. In this sample of establishments, in-house centers tended to adopt a relatively coherent quasi-professional approach to service interactions compared to outsourced and offshore sites, with in-house jobs characterized by higher levels of initial investments in training and pay, greater discretion, and more problem-solving opportunities. Offshore centers, by contrast, had somewhat higher levels of formal education and initial training, significantly lower levels of employee discretion and problem-solving, and higher levels of electronic monitoring and performance management. From a managerial perspective, U.S. outsourced centers seem to present the worst of both worlds: lower formal education and training levels than in-house or offshore centers, low levels of discretion and problem-solving that closely resemble offshore centers, and levels of pay much closer to those found among in-house operations than among Indian centers.

In further multivariate analyses, we found that outsourced and offshore centers had significantly higher quit rates after controlling for the market segment served, union presence, and measures of employee human capital. Systematic differences in work design, however, explained most of the variation in quit rates so that the significance of ownership status disappeared when these practices were included in our equations. That is, ownership status is

an important driver in the choice of management and employment practices, with outsourced and offshore centers more constrained to follow standardized operating procedures and performance monitoring. It is these practices, in turn, that explain the higher quit rates in these centers.

There are several limitations to this study. One concerns the representativeness of our samples, which we discussed earlier. Because larger organizations are over-represented in our samples, if anything the study overstates the level of workforce education, pay, and levels of employee participation in call centers. We have no reason to believe that the bias is greater in one sample or the other, but there is really no way to test this deficiency in the data. A second limitation is that these large scale surveys provide only single-sourced data, and external labor market data from India is not available to assess the relative value of call center pay in that country compared to relative pay levels in the U.S.

A third limitation is that we cannot determine whether differences in management and employment systems are due to differences in levels of complexity in work functions or differences in business strategies based on quality and cost. Complexity and quality service strategies are highly correlated, such that companies tend to adopt quality strategies for higher value-added functions, which typically are more complex in nature. In our analysis of average differences across ownership types, we used various methods to compare centers by industry and customer segment as well as work function. In each of these analyses, we found systematic differences based on ownership type. However, sample size restrictions prevent us from determining whether differences are due to business strategies, service complexity, or some combination of both.

In addition, the outcome measured in this study is limited. On the one hand, turnover is a useful metric to analyze because the industry has unusually high levels of workforce churn, which is widely recognized to be problematic and costly. There is also considerable empirical evidence to show that turnover is associated with lower service quality and productivity. On the

other hand, future research needs to examine a much wider array of performance measures that directly capture operational quality and productivity if we are to understand the relative costs and benefits of alternative service management strategies.

Despite these limitations, the findings are consistent with other research on subcontracting relations. For example, subcontractors are more likely to have standardized processes and use more performance monitoring and metrics, a pattern that supports Ravi Aron's argument in this volume that these practices are central to reducing operational risk. Aron's finding that workforce training does not have a large effect on reducing operational risk is also consistent with our analysis. Despite the fact that offshore centers in India hire workers with relatively high levels of education and offer considerable initial training, the high levels of process standardization do not let employees use their human capital in ways that can improve operational performance. This point is reiterated in the work of Vivek Agrawal (this volume) who demonstrates that the return to investment in technology in Indian call centers is far below that found in the U.S. He notes that this 'cookbook' approach to management reduces the incentives to innovate or constrains the ability to move up the value chain.

Our findings have several policy implications at the level of managerial strategy and broader public policy. At the level of managerial policy, the evidence is clear that the extensive use of routinized work processes in call centers leads to high levels of turnover, which are associated with lower service quality and productivity. Moreover, to the extent that call centers hire college-educated workers, the highly constrained and monitored work system creates an inefficient use of human capital -- a particularly bad fit between selection and recruitment policies on the one hand, and work design policies on the other. The under-utilization of human capital represents a substantial loss for Indian subcontractors, as they are paying for skills that they are not using.

Thus, to the extent that companies have complex service offerings or want to compete on the basis of service differentiation, quality, or customer loyalty, then they are likely to retain

customer contact interactions in-house, consistent with the transaction costs perspective and core competency argument. To date, this appears to be what most U.S. corporations are doing: after two decades of rapid growth of U.S. call centers, most industry estimates are consistent with our own survey that less than 15 percent of U.S. call centers are run by third party subcontractors; and only a tiny fraction have moved offshore.

However, for those transactions that are simple and codifiable, companies are likely to continue to expand their operations offshore. Our data suggest that the strategy of outsourcing operations to U.S. subcontractors is likely to be a transitory one, as the modest reductions in labor costs (compared to subcontractors offshore) may be offset by the high costs of turnover and low levels of employee skill. According to this scenario, the U.S. subcontracting sector, which grew dramatically in the 1990s, will be the hardest hit by Indian competition. If these findings hold across a larger and more representative sample of establishments, then the shift in customer contact employment from the U.S. to India is likely to be considerable, but remain confined to stand alone work functions that are relatively simple or transactional. Under this scenario, the problem for both U.S. and Indian subcontractors is that stand alone call centers appear to be failing (see Dossani, this volume).

An alternative scenario is that Indian call centers will gain the ability to compete more fully on the basis of quality and customer service as well as price. In theory, this is possible. With an educated workforce and high relative pay for the Indian labor market, Indian centers could be poised to handle more complex and nuanced customer transactions and provide service that builds customer loyalty. However, the current work systems are not in any way geared towards that alternative, but rather contain fundamental contradictions that are reminiscent of the problems of high turnover among overqualified workers in the monotonous jobs found in U.S. manufacturing industries in the 1960s and 1970s (HEW 1973). Current analyses of the potential for high quality service in offshore centers give too much weight to the level of formal education among workers and too little weight to the organization of work and

technology, which shape the effective use of that human capital (Jaikumar, 1986). However, case study evidence by Rafiq Dossani (this volume) shows that some call centers have been able to move up the value chain and expand their operations to include increasingly complex processes. Whether these examples of best practice can expand to the majority of call centers in India remains to be seen. The issue is whether the current approach to managing vendor relations – through tight control by client firms -- is considered so fundamental to limiting costs and operational risk that it will not be abandoned, or whether it is a temporary phenomenon that will give way over time to closer supplier relations built on trust. In the former case, the Indian call center sector would continue to handle relatively simple, codifiable, low value-added transactions. In the latter case, the offshore market could expand to cover a much larger portion of the U.S. customer contact business. Even here, however, companies will need to learn much more about what kinds of tacit knowledge and contextual understandings are needed for which types of customer interactions. In service settings where ‘bridging to sales’ is a major source of revenues, for example, tacit knowledge of cultural norms may still be an important source of competitive advantage, thereby favoring U.S. in-house or outsourced locations.

A third alternative could involve a combination of organizational forms, with companies using a number of in-house, outsourced, and offshore venues to manage similar types of customer interactions. In our field research, we found a number of cases of this emerging strategy; and Ravi Aron in this volume demonstrates that this ‘extended’ model of organization may hold the most promise for quality and productivity in the long run. This approach allows companies to create competition for cost and quality innovations among their own subsidiaries and vendors. It also allows for organizational flexibility, so that client firms can adjust volumes and vendor contracts to seasonal demand. Similarly, some U.S. multinational subcontractors are offering a variety of venues to client firms, including a combination of on-shore and off-shore call centers, with volumes able to fluctuate according to seasonal demand. These strategies

may help U.S. subcontractors survive as client firms exert on-going pressure to reduce costs.

These scenarios also depend on the role that public policy plays in human resource development. In India, there is evidence that demand is outstripping the supply of skilled labor, at least in the short run, in call centers cities such as Bangalore and Chennai. Thus, there is a need for the Indian government to invest in the skills and human resource infrastructure needed to respond to external demand.

In the U.S., the question is whether subcontractors are able to improve the skill base of the workforce. They may be able to do so in locations where they have access to certification programs and community college and associate degree programs in customer service management. Because centers are often co-located in 'call center cities' – such as Jacksonville, Tucson, San Antonio, Omaha, or Phoenix, there may be opportunities to build a skilled labor pool with access to on-going education and opportunities for multi-employer job ladders that help stabilize employment. Our survey results suggest that public support for the industry is available, with 49 percent of outsourced call centers reporting that they use public training resources and programs. Nearly all of the managers we interviewed in the outsourced industry relied heavily on local universities, community colleges, and partnerships with welfare-to-work and public sector organizations to recruit employees. These resources offer the potential to improve the quality of the workforce. However, we found that they are often used to substitute for internal investments in employee skills and discretion rather than to support a more professional or high commitment strategy. Thus while these types of innovations could allow U.S. subcontractors to improve the quality of their workforce and employment practices, the limited evidence in our study suggests that public sector resources are being used to supplant, rather than complement, private investment in human resource systems. If this represents the future among U.S. subcontractors, then they are unlikely to remain competitive in relation to their Indian counterparts.

References

- Abraham, K. 1990. Restructuring the employment relationship: The growth of market-mediated work arrangements. In K. Abraham & R. McKersie (Eds.), New developments in the labor market: 85-118. Cambridge, MA: MIT Press.
- Appelbaum, E., Bailey, T., Berg, P., & Kalleberg, A. L. 2000. Manufacturing Advantage: Why High Performance Work Systems Pay Off. Ithaca, NY: Cornell University Press.
- Barney, J. 1991. Firm Resources and Sustained Competitive Advantage. Journal of Management, 17(1): 99-120.
- Batt, R. 1999. Work Organization, Technology, and Performance in Customer Service and Sales. Industrial and Labor Relations Review, 52(4): 539-564.
- Batt, R. 2000. Strategic Segmentation in Front-line Services: Matching Customers, Employees and Human Resource Systems. International Journal of Human Resource Management, 11(3): 540-561.
- Batt, R. 2002. Managing Customer Services: Human Resource Practices, Quit Rates, and Sales Growth. Academy of Management Journal, 45(3): 587-597.
- Batt, R., Colvin, A., & Keefe, J. 2002. Employee Voice, Human Resource Practices, and Quit Rates: Evidence from the Telecommunications Industry. Industrial and Labor Relations Review, 55(4): 573-593.
- Batt, R. & Moynihan, L. M. 2004. "Human Resource Practices, Service Quality, and Economic Performance in Call Centers." CAHRS working paper No. 04-16.
- Batt, R., Doellgast, V., & Kwon, H. 2004. The US Call Center Industry 2004: National Benchmarking Report. Ithaca, NY: Cornell University.
- BLS (Bureau of Labor Statistics). 2005. Occupational Employment and Wage Survey, 2004. May. (www.bls.gov/oes).
- Carayon, P. 1993. Effect of Electronic Performance Monitoring on Job Design and Worker Stress - Review of the Literature and Conceptual-Model. Human Factors, 35(3): 385-395.
- Datamonitor. 2001. US Customer Relationship Outsourcing to 2005. London: Datamonitor.
- Datamonitor. 2003. Opportunities in North American Call Center Markets to 2007. New York: Datamonitor.
- Datamonitor. 2004. The Vertical Guide to Contact Centers in North America: Tracking Sector Needs in a Mature Market. New York: Datamonitor.
- Davis-Blake, A. & Uzzi, B. 1993. Determinants of Employment Externalization: A Study of Temporary Workers and Independent Contractors. Administrative Science Quarterly, 38: 195-223.
- Deery, S. J., Iverson, R. D., & Walsh, J. P. 2002. Work Relationships in Telephone Call Centers: Understanding Emotional Exhaustion and Employee Withdrawal. Journal of Management Studies, 39(4): 471-497.
- Dossani, R. & Kenney, M. 2004. Went for Cost, Stayed for Quality? Moving the Back Office to India, Draft.
- Erickcek, G. A., Houseman, S. N., & Kalleberg, A. L. 2003. The Effects of Temporary Services and Contracting Out on Low-Skilled Workers: Evidence from Auto Suppliers, Hospitals, and Public Schools. In E. Appelbaum & A. Bernhardt & R. J. Murnane (Eds.), Low-Wage America: How Employers are Reshaping Opportunity in the Workplace: 368-403. New York: Russell Sage Foundation.
- Freeman, R. B. & Medoff, J. L. 1984. What Do Unions Do? New York: Basic Books.
- Frenkel, S., Tam, M., Korczynski, M., & Shire, K. 1998. Beyond Bureaucracy? Work Organization in Call Centres. International Journal of Human Resource Management, 9(6): 957-979.

- Grugulis, I., Vincent, S., & Hebson, G. 2003. The future of professional work? The rise of the network form and the decline of discretion. Human Resource Management Journal, 13: 45-59.
- Heskett, J. L., Sasser, E. W., & Schlesinger, L. A. 1997. The Service Profit Chain. New York: The Free Press.
- Holman, D. 2004. Employee Well-being in Call Centres. In S. Deery & N. Kinnie (Eds.), Call Centres and Human Resource Management: 223-44. Basingstoke: Palgrave
- Holman, D., Chissick, C., & Totterdell, P. 2002. The effects of performance monitoring on emotional labour and well-being in call centres. Motivation and Emotion, 26(1): 57-81.
- Jaikumar, R. 1986. Postindustrial manufacturing. Harvard Business Review.
- Keltner, B. 1998. Strategic Segmentation in Services, Unpublished manuscript.
- Kinnie, N. & Parsons, J. 2004. Managing Client, Employee and Customer Relations: Constrained Strategic Choice in the Management of Human Resources in a Commercial Call Centre. In S. Deery & N. Kinnie (Eds.), Call Centres and Human Resource Management: 102-126. Basingstoke: Palgrave.
- Lepak, D. P. & Snell, S. A. 1999. The human resource architecture: Toward a theory of human capital allocation and development. Academy of Management Review, 24(1): 31-48.
- Levy, F., & Murnane, R. 2002. The New Division of Labor: How Computers are Creating the Next Job Market. Princeton: Princeton University Press.
- Loveman, G. W. 1998. Employee Satisfaction, Customer Loyalty, and Financial Performance: An Empirical Examination of the Service Profit Chain in Retail Banking. Journal of Service Research, 1(1): 18-31.
- Maddala, G. S. 1992. Introduction to Econometrics. 2nd Ed. New York: Macmillan.
- Marsden, D. 1999. A Theory of Employment Systems: Micro-foundations of Societal Diversity. Oxford: Oxford University Press.
- McDonald, J. F. & Moffitt, R. 1980. The uses of tobit analysis. Review of Economics and Statistics, 62: 318-321.
- Pfeffer, J. & Baron, J. 1988. Taking the workers back out: Recent trends in the structuring of employment. Research in Organizational Behavior, 10: 257-303.
- Pine, B. J. 1993. Mass Customization: The New Frontier in Business Competition. Boston: Harvard Business School.
- Prahalad, C. K. & Hamel, G. 1990. The Core Competence of the Corporation. Harvard Business Review, 68(3): 79-91.
- Quinn, J. B. 1992. Intelligent Enterprise. New York: Free Press.
- Shaw, J. D., Delery, J. E., Jenkins, G. D., Jr., & Gupta, N. 1998. An organization-level analysis of voluntary and involuntary turnover. Academy of Management Journal, 41(5): 511-525.
- Shire, K., Holtgrewe, U., & Kerst, C. 2002. Re-Organising Customer Service Work: An Introduction. In U. Holtgrewe & C. Kerst & K. Shire (Eds.), Re-Organising Service Work: Call Centres in Germany and Britain: 1-16. Aldershot: Ashgate.
- Singh, J. 2000. Performance productivity and quality of frontline employees in service organizations. Journal of Marketing, 64(2): 15-34.
- Ventoro. 2005. Offshore 2005 Research: Preliminary Findings and Conslusions. Ventoro.
- Williamson, O. 1981. The modern corporation: Origins, evolution, attributes. Journal of Economic Literature, 19: 1537-1568.
- Williamson, O. E. 1985. The Economic Institutions of Capitalism. New York: The Free Press.
- UNICEF cite from webpage: http://www.unicef.org/infobycountry/india_statistics.html

Appendix 1

Estimates of U.S. Call Center Workforce, 2004

To estimate the number of call center jobs in the U.S., we used the May, 2004, Occupational Employment and Wage Survey of the Bureau of Labor Statistics (BLS 2005). We chose “office and administrative support occupations” (NAICS 43-0000). Within that category, we chose the sub-occupations that were most likely to be located in call centers, based on the BLS description of work tasks and our own knowledge of call center operations. We also included telemarketers from sales occupations. The following chart details the employment numbers, percent of sample, and mean wages for those sub-occupations.

	Employment numbers	% of U.S. workforce	Mean hourly wage	Mean annual wage
Switchboard, answering services	206,370	0.15%	\$10.81	\$22,490
Telephone operators	38,500	0.03%	\$14.53	\$30,220
Bill & account collectors	445,180	0.32%	\$13.95	\$29,010
Credit authorizers & checkers	66,010	0.05%	\$15.15	\$31,520
New accounts clerks	96,560	0.07%	\$13.55	\$28,180
Order clerks	289,830	0.21%	\$12.85	\$26,730
Reservation agents, travel clerks (excludes travel agents, hotel clerks)	159,910	0.11%	\$14.48	\$30,120
Insurance claims & policy processing clerks	239,250	0.17%	\$14.70	\$30,580
Customer service representatives	2,021,350	1.45%	\$14.01	\$29,130
Telemarketers	410,360	0.29%	\$11.29	\$23,490
Total CC workers	3,973,320	2.85%	\$13.53*	\$28,147*

* Weighted average, weighted by number employed by occupational group.

Source: BLS, Occupational Employment Statistics, May, 2004 (www.bls.gov/oes)

By this methodology, there were an estimated 3.97 million call center workers in the U.S. in 2004, representing 2.85 percent of the working population. This estimate, however, undercounts some workers while overcounting others. Overcounting may occur because some of the workers in the categories below may provide face-to-face service. Undercounting occurs because this tabulation does not include other sales agents besides telemarketers, and many call centers define their work as primarily sales. If one subgroup of sales agents is included (“sales representatives, services, other” (NAICS 41-3099), then the estimated number of call center workers rises to 4.33 million, or 3.11 percent of the workforce. By these calculations, a reasonable estimate of the U.S. call center workforce in 2004 is between 2.5 and 3 percent of the U.S. workforce.

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² Data on numbers of call centers and employment come largely from interested parties, such as NASSCOM in India, and industry consultants such as Datamonitor in the U.S. NASSCOM put the number of call center positions in India at 158,000 in 2004. For the U.S. in 2001, Datamonitor estimated a total call center workforce of 2.5 million, with 88.7 percent located in in-house centers and 11.3 percent in outsourced centers. It projected that by 2005, call center employment would grow by 14%, reaching a total of 2.86 million, with 13.4 percent located in outsourced centers (Datamonitor, 2001). Datamonitor bases its estimates on market research and the sale of call center work stations and other technology. Numbers of work stations may underestimate employment because they may be used for 2 or 3 shifts of workers. More recently, Datamonitor estimated that the U.S. call center employment would fall to 2.7 million positions in 47,500 call centers by 2008 (Datamonitor, 2004). Our calculations, based on BLS data, suggest a U.S. call center workforce in 2004 of 3.97 million, or a range of between 2.5 and 3 percent of the workforce. These calculations are limited by the available data. See appendix 1 for a technical note on these calculations.

³ The adjustment based on the second term in the McDonald and Moffit (1980) decomposition is calculated by multiplying the tobit coefficients by $[1 - z \cdot f(z)/F(z) - f(z)^2/F(z)^2]$, where $F(z)$ is the cumulative normal distribution function associated with the probability of cases being above the left limit, $f(z)$, the first derivative of $F(z)$, is the unit normal density associated with this probability, and z is the corresponding z -score for this probability (see Roncek 1992).