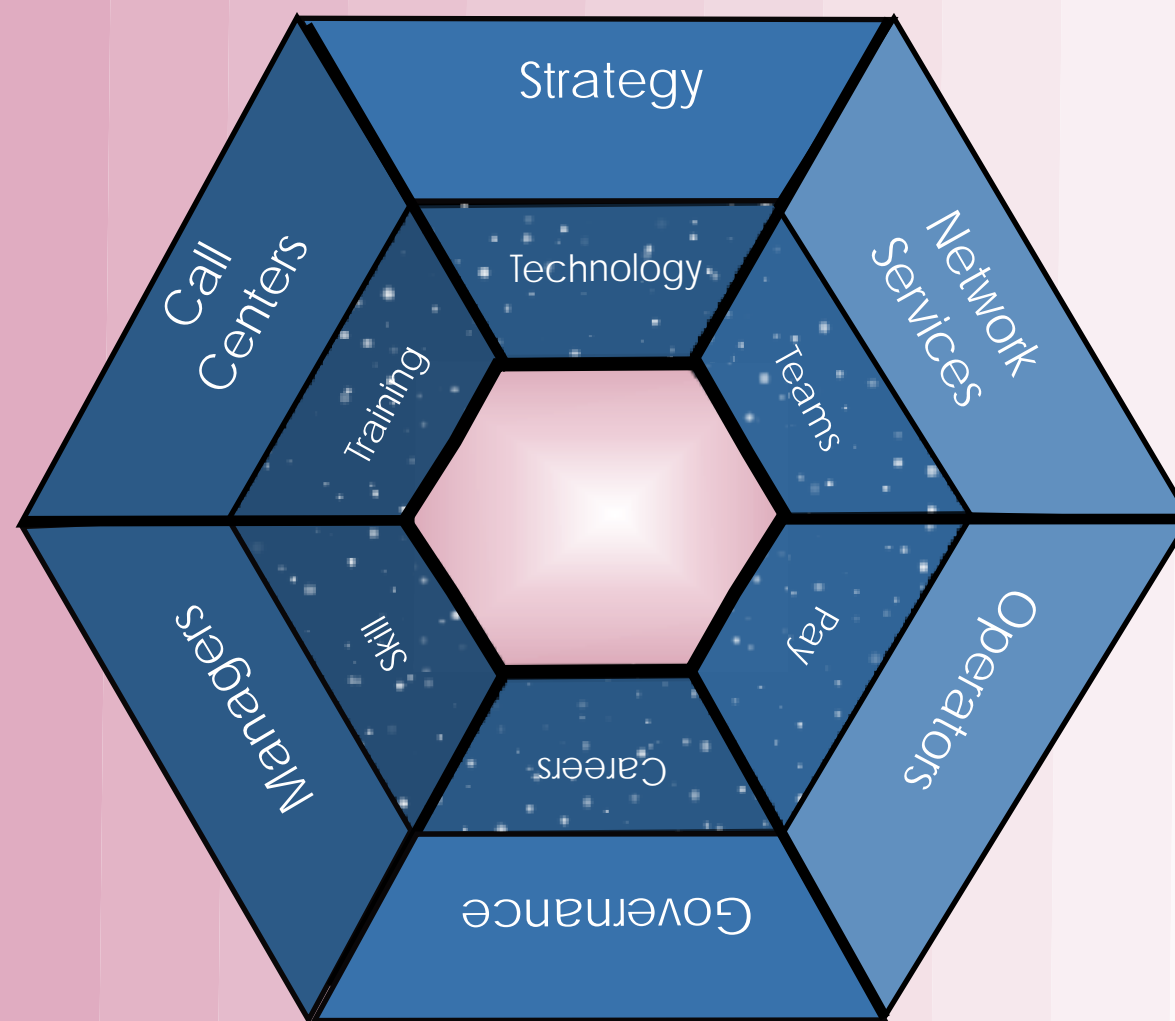


Telecommunications 2000 Strategy, HR Practices & Performance



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Highlights

As the telecommunications services industry enters the 21st Century, it is experiencing its most dynamic period since Bell's discovery of voice transmission over a century ago. Accelerated technology innovation and competition under deregulated markets have combined to produce tumultuous changes in service offerings, industry boundaries, and corporate restructuring. The digital revolution in the 1990s has created the potential for a myriad of interactive multimedia products. Market boundaries are eroding among wireline, wireless, cable, and internet providers as well as producers of information — from publishers and film makers to software developers and video game makers.

While the popular press has covered these large scale changes, they have paid much less attention to the challenges that managers and employees in this industry face in their daily work...

- how to position the business in a constantly changing competitive environment
- how to build a skilled workforce in a period of rapid technology change
- how to retain a committed workforce amidst exploding growth and tight labor markets

Managers have had the difficult job of crafting appropriate business strategies and human resource practices in the face of technological uncertainty, volatile demand, and heightened competition in deregulated markets. Similarly, frontline employees have confronted on-going change in product offerings, in legal regulations, and in new work methods and technical processes. Thus, they have needed to regularly upgrade their knowledge and skills in order to serve customers well and to maintain their own employment and income security. This report addresses these and other issues of concern to managers and employees in the telecommunications industry.

This report constitutes the first benchmarking survey of business and human resource practices among a nationally representative sample of workplaces in the broadly defined telecommunications industry that includes wireline, wireless, cable, and internet providers. It grows out of a multi-year study of organizational change in the industry, and is based on extensive field study, site visits, interviews, and surveys conducted by research teams at Cornell and Rutgers Universities. Managers at 577 establishments across the country gave generously of their time during a lengthy telephone survey. The study was made possible through a generous grant by the Alfred P. Sloan Foundation.

While this report is based on data collected among workplaces in the U.S., it has implications for the restructuring of the global telecommunications industry. In other research, we have found that the United States has been at the forefront of market deregulation and technology change, but many other countries have followed a similar path and look to the United States as a model for organizational restructuring (Katz 1997). Thus, at least some of the patterns we find here are likely to occur in other countries undergoing similar patterns of deregulation.

Acknowledgements

We would like to thank the Alfred P. Sloan Foundation, especially Hirsh Cohen, for generous funding and support for this study. Thanks to Alice Stelmach (alice_stelmach@bigfoot.com) for her excellent work as Publications Manager. The survey was ably administered by the Computer Assisted Survey Team (CAST), ILR School, Cornell University. Thanks also to Danielle Van Jaarsveld for her diligent research assistance and to the managers in the industry who gave generously of their time to complete the survey.

What's in this report?

Given this environment of rapid change and uncertainty, managers have experimented with a wide range of business and human resource practices. In this report, we examine:

- The skills of the workforce and investments in training
- Alternative approaches to using information technology
- Adoption of “high involvement work practices” such as quality improvement teams and self-directed teams
- Use of flexible staffing, including the part-time and contingent workforce
- Use of performance-based pay
- Wages, benefits, and total compensation levels
- The role of unions in the workplace
- Alternative approaches to governance and dispute resolution procedures

We provide data on the frontline workforce and managers in the two primary sides of the business:

- customer service and sales operations, including operator services
- network operations, including central office and field technicians

What we found.

The HR-Turnover-Performance Link....

□ *Employee Turnover:* Attraction and retention of skilled employees has increased in strategic importance in this environment of dynamic growth and tight labor markets. This study found a significant relationship between HR and labor relations practices and quit rates. Turnover is significantly lower in establishments that adopt “high involvement” work practices - including work designed to provide employees greater discretion in serving customers, the use of

problem-solving and self-managed teams, investment in skills and training, the availability of promotion opportunities, and high relative pay and rewards. Quit rates are significantly higher in establishments that have downsized and that rely heavily on electronic monitoring, variable pay, and contingent and part-time staffing. Also, average quit rates are three times higher in non-union establishments than in union establishments.

□ *HR practices and sales growth:* the use of high involvement work practices is a significant predictor of higher sales growth in customer service and sales centers. High involvement practices have a direct positive relationship to sales growth. They also have an indirect effect by lowering turnover: turnover has a significant negative effect on sales growth in call centers.

In Customer Service and Sales....

□ *Customer segmentation:* Segmentation strategies have become the predominant approach to organizing retail distribution channels. Three-quarters of managers said they targeted a particular customer segment. The remainder take a universal approach of serving multiple segments through the same channel.

□ *Business strategy:* Most managers report that they compete on the basis of quality and customer service, and rate cost competition as their lowest priority.

□ *Human resource strategy:* Most managers rate their highest priority as that of maintaining a skilled and committed workforce. Again, concerns about lowering labor costs or cutting employment are rated as the lowest priority.

□ *Who adopts high involvement work practices:* We found that centers targeting higher value added

business customers were significantly more likely to adopt high involvement practices than were centers in operator services or those serving residential consumers.

□ *High involvement practices and organizational performance:* Despite the fact that high involvement practices are more likely to be adopted in centers serving business customers, we found that high involvement practices led to lower turnover and higher sales growth in all centers, not just those targeting business customers.

□ *Use of information technology and organizational performance:* We examined two uses of information technology — its use for electronic monitoring of performance and its use as a resource of information (such as extensive use of software programs and data bases). We found that extensive use of electronic monitoring significantly raises voluntary turnover, while the use of information technology as a resource significantly lowers quit rates.

□ In sum, our findings suggest that the production line approach to call center management doesn't "fit" the complexities of serving today's residential or business customers. Given the wide variety of products and services in today's market, firms want to compete on the basis of bundling services — or "mass customization". To do so, however, requires investment in human resources. The variety and customization options available for today's mass market products call for better skilled workers who know the products and have the opportunity to respond to customers as needed. High involvement work systems motivate them to do so.

In Network Operations....

□ *Technician pay:* Technician pay is largely driven by education level, network digitalization,

and unionization. The returns to graduate education are extremely high in this industry, approximately 135% greater than a high school education. Both unionization and network digitalization yield a 15% premium. Cable television technicians earn 30% less than other technicians in the industry.

□ *Technician employment:* Technician employment is still concentrated at the local exchange carriers, who employ 74% of all technicians and 81% of all field technicians.

□ *Flexible human resource practices:* Variable pay, contingent workers, and downsizing have been widely adopted by the newer entrants in the industry: wireless, internet service providers, and some long distance carriers. Local exchange carriers, in contrast, rely on more traditional human resource practices that are associated with long tenure employees: promotions, pay linked to experience, employment security, and training.

□ *Unions:* Unions represent 76% of telecommunications technicians but only 36% of the establishments covered by this survey, indicating that unions represent the largest establishments in the industry. Local exchange carriers employ 95% of the unionized technicians in the industry.

□ *Office technicians:* 26% of the technicians surveyed are office versus field technicians. They tend to be more educated than field technicians and are more likely to participate in offline problem solving teams and self-directed teams.

□ *Perpetual change:* One out of three technicians in the survey work at a site that has changed ownership in the last five years. Major reorganizations of work and responsibilities are occurring at about one per year.

Regarding Managerial Employees...

□ *Managerial pay:* Managerial pay and manager-to-worker pay differentials vary sizably

across customer service and sales operations that target different market segments.

□ *Managerial numbers:* Across customer service and sales operations, the percent of the work force that is managers varies substantially, ranging from 30% in those centers targeting the middle market to 9% in operator services. In small business and residential centers, the comparable figure is 15%.

□ *Front-line supervisors:* The number of workers per front-line supervisor is higher among union versus non-union establishments; and it is especially low among non-union customer service and sales oriented establishments.

In Dispute Resolution Procedures...

□ *Types of dispute procedures:* Types of nonunion dispute resolution procedures used vary significantly across establishments. Approximately half of all establishments had some type of formal dispute resolution procedure for nonunion employees. The most common feature of these nonunion dispute resolution procedures is provision for review of the employee's complaint by someone from outside of the management chain of command (35% of all establishments had procedures including this feature). Just under

twenty percent of all establishments had procedures that included an appeals board consisting of managers who hear employee complaints. Least common are two features involving review of complaints by non-managers. Only 13.1 percent of all establishments had procedures that included peer review panels, where employees who are peers of the complainant form a majority on a board reviewing the complaint. Finally, arbitration was used in formal nonunion dispute resolution procedures in only 6.6% of all establishments..

□ *Use of dispute procedures:* Complaint rates and appeals of disciplinary decisions are higher under nonunion arbitration or peer review procedures, but are much lower than levels in unionized establishments.

□ *Discipline and termination rates:* Discipline and termination rates are lower under nonunion arbitration or peer review procedures than where there is no dispute resolution procedure. They are similar to rates in unionized establishments.

□ *Employee turnover:* Voluntary quit rates are lower under nonunion arbitration or peer review procedures, but much higher than in unionized establishments.

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Appendix B: Detailed Tables

1.0 Industry Overview

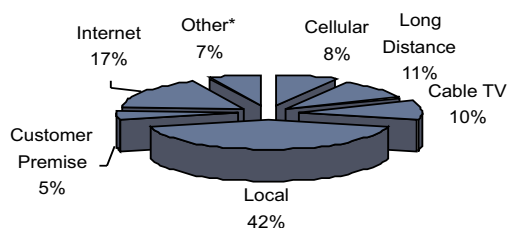
In this section of the report, we describe the structure of the industry and organizations. The patterns we describe are based on a survey of a nationally representative sample of establishments based on the Dun and Bradstreet listing. General managers at each workplace, not managers at corporate headquarters, provided information on the strategies and practices used at their particular work-site (see Appendix A for details on the sampling and survey methods used).

operations, long distance, cellular, and cable TV are roughly equally represented. In network, there is a larger representation of internet providers, as well as long distance and cable TV (see Figures 1.1a and 1.1b).

1.1 Markets and Industry segments

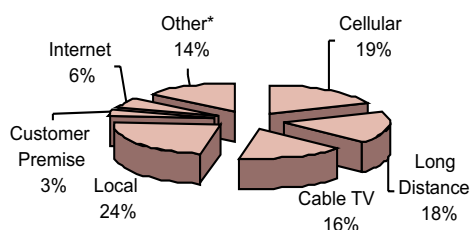
This report covers almost 600 establishments in the telecommunications industry, 354 in customer service operations and 223 in network operations. The total workforce in these establishments is 115,000 in customer service operations and 51,000 in network operations. Included are 6 market segments in the industry: local exchange, long distance, cellular, customer premise equipment, cable TV, and internet providers.

Figure 1.1b Percent of Surveyed Establishments, by Market Segment-Network.



*Includes paging, yellow pages, other data and information services.

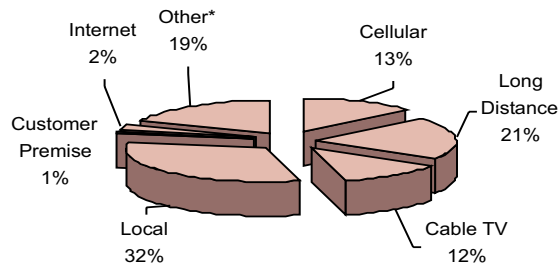
Figure 1.1a % of Surveyed Establishments, by Market Segment—Customer Service and Sales.



*Includes paging, yellow pages, other data and information services.

When viewed from the perspective of employment in the industry, the patterns are similar, but the differences between the local exchange market and others are accentuated. This reflects the fact that local exchange continues to be dominated by former Bell System companies, which are larger in size than new entrants into the industry (Figures 1.1c and 1.1d).

Figure 1.1c Percent of the Surveyed Workforce, by Market Segment Customer Service and Sales.

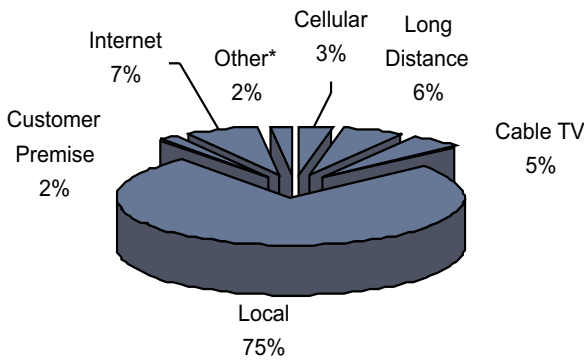


*Includes paging, yellow pages, other data and information services.

As shown in Figures 1.1a and 1.1b, the largest percentage of workplaces in this study serve the local exchange market. In customer service

In sum, most of the workforce continues to be employed by large firms with a long history in the Bell System. However, deregulation has led to the entry of many new smaller players. Thus, the industry structure is quite bi-polar, consisting of a small number of large players and a large number of small players.

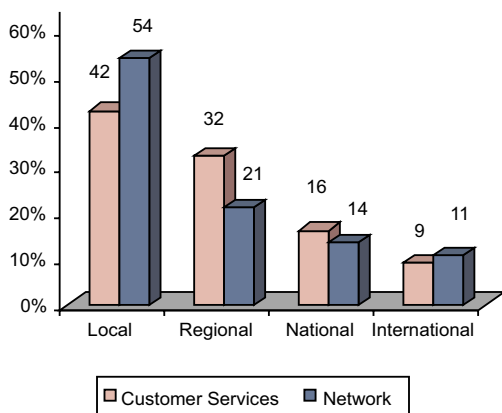
Figure 1.1d Percent of the Surveyed Workforce, by Market Segment-Network.



*Includes paging, yellow pages, other data and information services.

The markets in which these establishments compete are also primarily local. In customer services, 42% of call centers serve the local market, while 32% serve the regional market, and the remainder, national or international customers.

Figure 1.1e Scope of Market: Customer Services and Network Compared.

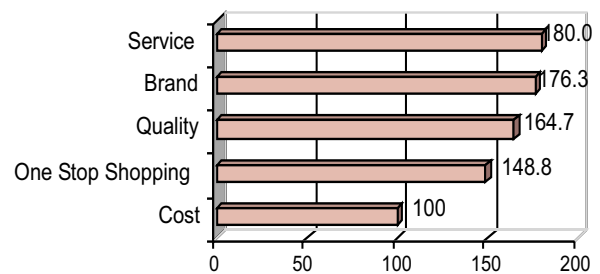


In network operations, 54 percent of establishments focus on the local exchange market, while 21 percent are regional, and almost a quarter are national or international in scope (Figure 1.1e).

1.2 Business and Human Resource Strategies

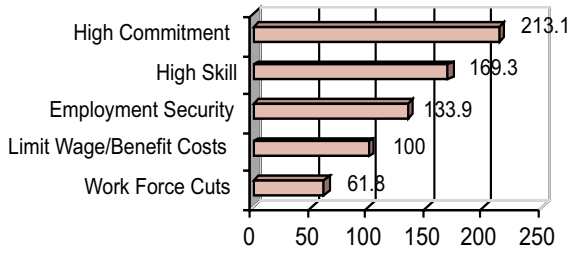
There are a variety of ways that firms can position themselves to compete in the context of volatile markets and the proliferation of service offerings. While some may choose to emphasize quality, variety, or service, others may compete by being the lowest cost carrier. We asked respondents to rate the importance of these strategies by assigning points to each. We found that most respondents gave much higher priority to quality, service, brand name, and one stop shopping. Low cost, by comparison, received the lowest average number of points (Figure 1.2a).

Figure 1.2a Relative Importance of Business Strategies.



Similarly, when asked what are their top strategies for human resource management, most managers rated the creation of a highly committed workforce as their first priority, followed by a highly skilled workforce. Again, they assigned the lowest number of points to lower labor costs or employment cuts, as indicated in Figure 1.2b.

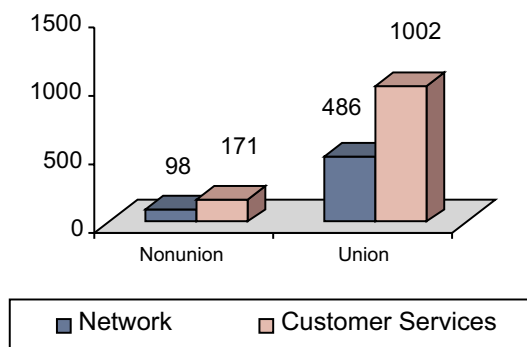
Figure 1.2b Relative Importance of Human Resource Strategies.



1.3 Organizational Characteristics

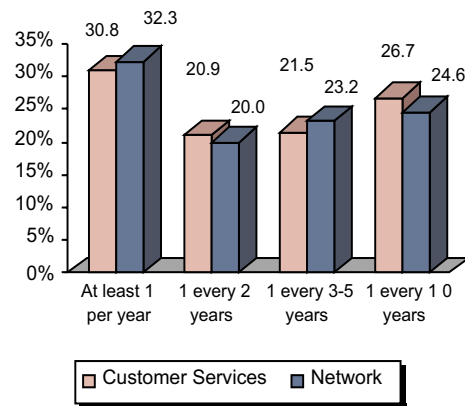
The study includes a wide range of organizations in terms of their size, structure, and whether they are branches of larger organizations. Most of the establishments in this study are owned by larger firms. In both customer services and network, 80% of the workplaces are branches of larger organizations, while 20% are small single firms. Establishments also range widely in size, from less than 10 employees to several thousand. As a reflection of the legacy of the Bell System, unionized establishments are smaller in number but larger in size than non-union establishments. This pattern holds in both customer service and network operations.

Figure 1.3a Average Size of Establishments, Union and Non-union Compared.



The structure of enterprises is also rapidly changing, which is not surprising given the wide spread merger and acquisition activity that has occurred in recent years. We asked respondents how often they had been through a major restructuring, such as a business unit reorganization, consolidation of offices, reengineering, or downsizing, in the last few years. We found that 30% or more of customer service and network organizations had been through a major organizational change at least once a year. Over 50% had experienced major restructuring at least once every two years. Thus, managers and workers in this industry face the difficult challenge of providing continuous high quality service to customers while in the midst of great organizational instability.

Figure 1.3b Frequency of Restructuring in Customer Services and Network.



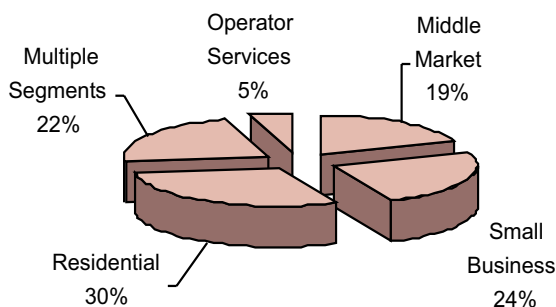
As part of restructuring, companies are attempting to streamline and reduce management layers. In this set of establishments, we found that the typical organization in both customer services and network had four levels of management, from the frontline supervisor to the general manager. In keeping with the concept of decentralized organization, almost half of the establishments in customer services had a human resource department located on site to handle employment issues. In network services, 40 percent of establishments had an HR department on site.

2.0 Customer Service & Sales Operations

This section focuses on the enormous changes that have transformed service and sales distribution channels over the last decade. While telecommunications grew up as a technology-driven business under historically regulated conditions, one of the most striking changes in the industry is the extent to which firms have come to espouse the strategic importance of customer service and sales operations.

However, we find that companies are pursuing a wide range of business strategies and human resource practices as they try to compete in an ever-changing competitive landscape. One major distinction is between “universal” and “segmented” approaches to marketing strategy. Almost one-quarter of the establishments in our survey are “universal” suppliers — serving a wide range of residential and business customers. The remaining establishments target a particular service or segment of the market, usually defined by the value of their accounts. For simplicity, we have divided the data into four groups: middle market businesses, small businesses, residential consumers, and those that serve all three segments. We also compare these four groups to operator services.

Figure 2.0a Percent of Establishments by Customer Segment.



Another major distinction is in the adoption of human resource practices. The service management literature identifies two broad approaches to managing the frontline service workforce. The first is referred to as the engineering or “production line” approach, and draws on the type of standardization and automation of processes characteristic of mass production manufacturing. It has grown as a means of improving low productivity growth in services, and firms typically focus on the performance metrics of maximizing call volume and minimizing labor costs. Automation eliminates low skilled work, and standardization of job tasks allows the organization to recruit relatively less skilled workers who require limited training. This approach usually entails high levels of electronic monitoring and little use of commitment-enhancing incentives such as investment in training and career development, high relative pay and rewards, or employment security.

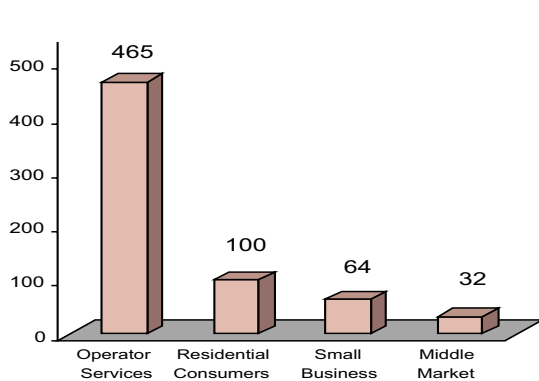
An alternative approach to human resource management is the “high involvement work system” model. It involves hiring higher skilled workers, providing them with the tools and discretion to respond to customer demands, investing in on-going learning through training and problem-solving teams, and creating commitment-enhancing incentives, such as career development and high relative pay. Information technology is used less for electronic monitoring, and more as a rich database of information that helps employees in their service and sales interactions with customers. This strategy views good service as a “bridge to sales.” Research by the Harvard Business School Service Management group has shown that loyal customers buy more, so that profitability per customer is multiplicative (Reichheld, 1996; Heskett et. al., 1997).

Our survey shows that the dividing line between these two approaches appears to be between those establishments serving the residential or mass market and those serving the business market. That is, while the production line approach traditionally characterized operator services, we find that this model characterizes many establishments serving residential customers. By contrast, centers targeting multiple customers or middle market businesses tend to adopt the high involvement model. Centers targeting small businesses represent an intermediate case. In the charts below, we show how human resource practices vary systematically across the centers serving these different customer segments. Appendix B also shows differences between union and nonunion centers serving residential and small business customers.

2.1 The Customer-Provider Interface

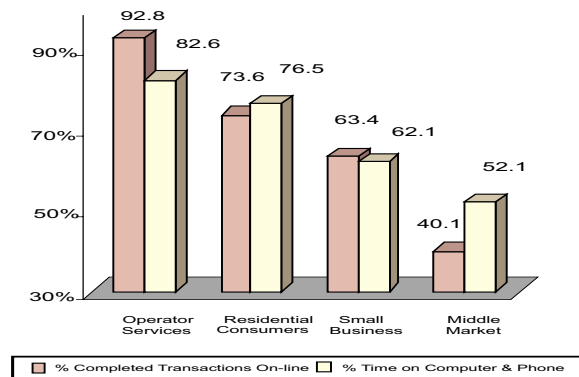
Because Operator Services represents the classic mass production model that is familiar to many in the industry, it is a useful anchor from which to examine the range of approaches to the customer across different segments. In our survey, the typical operator serves 465 customers per day. This represents the average of offices that range in size from very small offices of companies that are new entrants in the industry to fully automated offices in Bell System companies with several

Figure 2.1a Customers Per Employee Per Day.



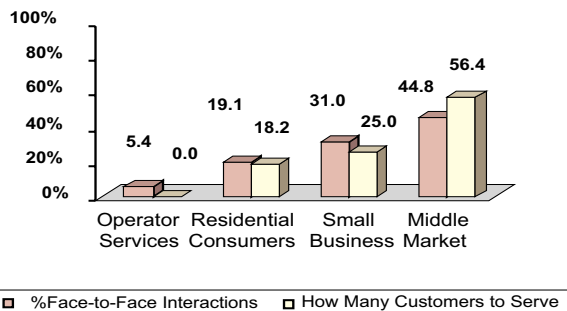
hundred employees. The typical customer transaction for operators (or call handling time) lasts less than 1 minute, and only in rare instances do operators have face-to-face interactions with customers. Ninety-three percent of transactions are completed while the customer is on line, and over 50% of the establishments surveyed used scripted texts most or all of the time. Operators spend 83% of their time simultaneously handling calls and manipulating computer databases. Compared to operator services, residential service agents must handle a wider range of customer inquiries that include setting-up new orders, adding enhanced features, arranging transfers, and handling billing issues. Because of added complexity and the opportunity to sell customized features or additional lines, centers serving residential customers are unlikely to use scripted texts; and less than 10% of the residential centers in this study made use of scripts. Customer-provider relationships, however, are still highly transactional in this segment, with the typical agent serving 100 customers per day, averaging 6 minutes per call, and having face-to-face interactions less than 20% of the time. These reps spend three-quarters of their work-time simultaneously answering calls and manipulating on-line databases. They complete nearly three-quarters of all transactions while the customer is on line.

Figure 2.1b Percent Completed Transactions On-line; Percent Time on Computer & Phone by Market Segment.



Small business agents have more opportunity to develop relationships with their customers and customize bundled service offerings. They handle 64 customers per day, and conduct roughly two-thirds their service transactions by phone, and one-third in face-to-face encounters with customers. They complete just over 60% of their transactions while on-line with the customer. Middle market service agents, by contrast, are much more likely to engage in relationship management. They serve 32 customers per day and almost half of their interactions are face-to-face on customer premises. They spend about half of their time simultaneously on the phone and on-line, and when they do so, they are able to complete only 40% of the transactions. About half of the middle market centers in the sample use dedicated account managers — that is, managers who are personally responsible for the accounts of particular customers. This approach is rarely or never used in residential or small business centers. In addition, middle market agents are about three times more likely than residential agents to have discretion over the types of customers and the number of customers they serve. This flexibility provides them with the opportunity to match their own strengths and abilities with customers of their choosing, and to target higher sales-generating customers.

Figure 2.1c Percent Face-to-Face Interactions and Discretion Over Number of Customers to Serve by Market Segment.

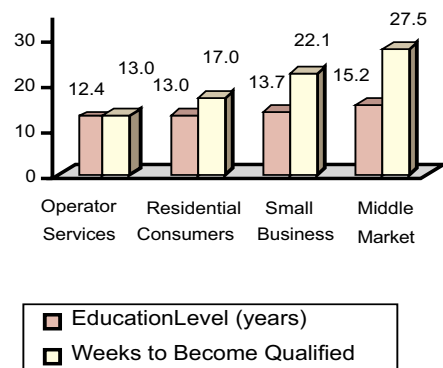


2.2 Skills and Training

Turning to the issue of skills and investment in training, the first noteworthy finding is that all of these service and sales jobs require considerable skill and training to be performed well. Even in operator services, for example, the average worker has a high school degree and has taken some post-secondary education courses. Moreover, managers estimate that it takes over three months for an operator to become proficient on the job.

In comparison to operators, the typical residential service rep has at least one year of post-secondary training. Small business reps average almost 2 years of college education, and middle market reps, 3 years. Said differently, in two thirds of the middle market establishments, the typical agent has a 4-year college degree. That figure is 15% in residential centers and 42% in small business centers. Also, the time it takes for the typical new hire to become qualified on the job varies significantly across the segments, 17 weeks for residential reps, to 22 weeks for small business reps and almost 28 weeks for middle market reps.

Figure 2.2a Years of Education and Weeks to Become Qualified by Market Segment.

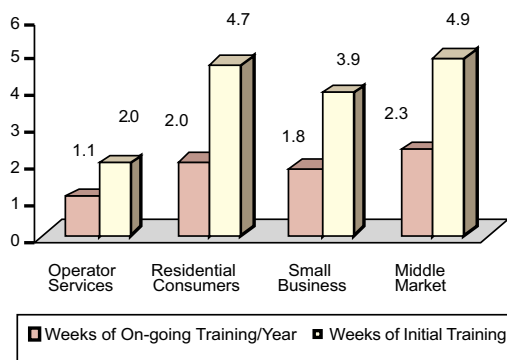


Even with these differences in education levels across segments, managers estimated that it takes

over twice as long to become proficient in serving middle market customers as it does to learn the job of an operator.

Telecommunications companies also make considerable investments in training for customer service agents in all segments. Training patterns show relatively little variation across different segments, with the exception of operator services. On average, operators receive 2 weeks of initial training, while workers in all other segments receive between 4 and 5 weeks. Similarly, operators receive about 1 week of formal ongoing training each year, while all others receive about 2 weeks per year. Two weeks of training per year is the equivalent of 3.8% of an employee’s annual work time. Given the fact that between a quarter and a third of the workforce in our study have less than 1-year of tenure on the job (see Figure 2.6a below), firms in this industry appear to be making substantial investments in workforce training.

Figure 2.2b Weeks of Initial and On-going Training by Market Segment.



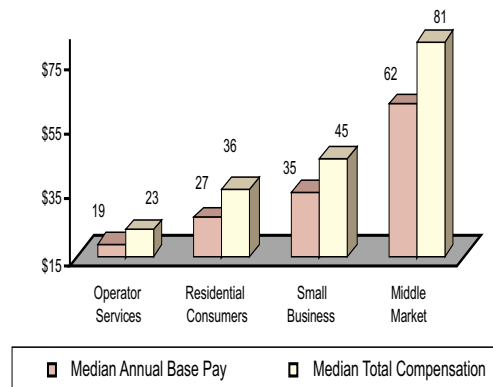
However, this investment in training reflects not only the low tenure of the workforce, but the fact that the knowledge and information that employees need to do their job well is constantly changing on a number of different fronts. With on-going deregulation, legal regulations governing

the industry and product offerings are a constant moving target. Regular changes in information systems require employees to continually learn new software programs and databases. Advances in technology have reduced product life cycles dramatically, and competition leads firms to regularly change their marketing strategies and packages. Thus, while training investments are considerable, it is not clear whether or not they are sufficient, given the high demand for new skills and information-processing entailed in these knowledge-intensive jobs. We also found significant correlations between higher investments in training and lower voluntary turnover.

2.3 Pay Levels and Total Compensation

Differences in pay levels are substantial across the distinct customer segments. Middle market reps earn about 3.5 times more than operators and nearly 2.5 times more than residential service reps. Median annual base pay in 1998 was \$19,382 for operators, \$27,271 for residential reps, \$34,786 for small business reps, and \$61,603 for middle market reps. Benefit costs averaged 17% for operators, 26% for residential reps, and 27% for middle market and small business reps.

Figure 2.3a Median Annual Base Pay and Total Compensation (in 000s) by Market Segment.



Median total compensation in 1998 (base pay, overtime, and benefits) was \$23,049 for operators, \$35,503 for residential reps, \$44,815 for small business reps, and \$81,377 for middle market reps. Significant differences in compensation between union and nonunion establishments are reported in Appendix B.

2.4 Use of Information Technology

Use of information technology varies dramatically across segments. The use of electronic monitoring for performance management is pervasive in lower value-added service operations. For example, in operator services the typical employee is electronically monitored two-thirds of the workday, and in residential services, 50% of the day. By contrast, small business reps are electronically monitored 34% of their day; and middle market reps, 21%.

Figure 2.4a % Time Electronically Monitored.

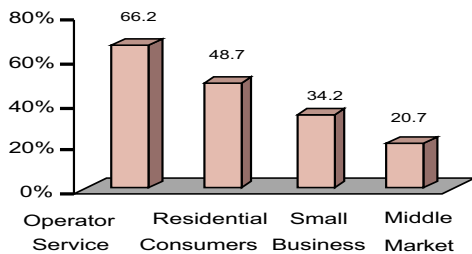
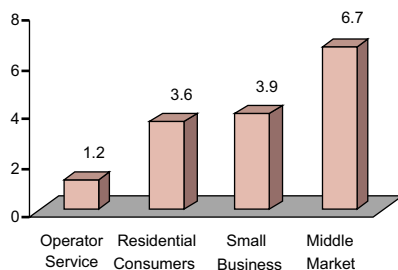


Figure 2.4b Number of Software Packages Used by Market Segment.

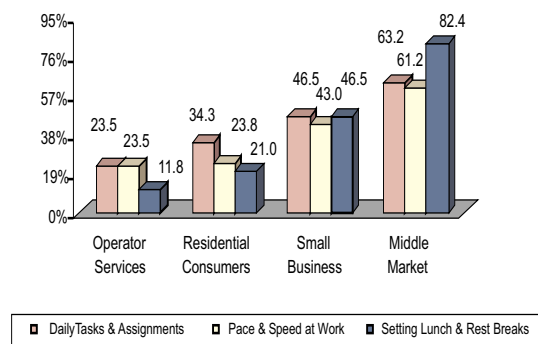


When information technology is used as a resource, an opposite pattern emerges. On average, operators use only one software package and receive about 3 emails per day regarding updates in procedures or changes in products. Residential reps must know about 3.6 different types of software programs, and they typically receive 10 emails a day with product and procedural updates. By contrast, middle market reps handle almost 7 software programs and receive 20 emails per day regarding information to do their job.

2.5 Discretion, Employee Participation, and Self-Directed Teams

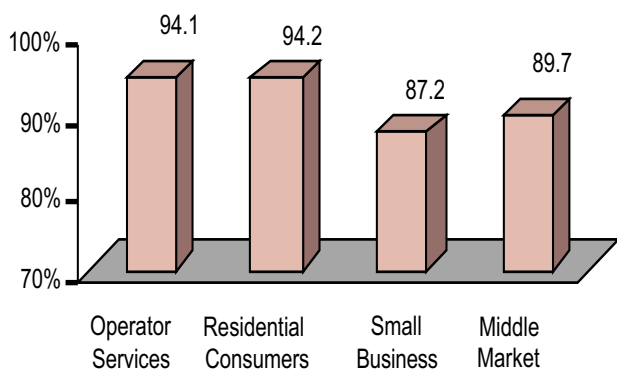
In daily work methods and schedules, the range of discretion again varies by segment served. In general, those serving the larger (middle market) business market are at least twice as likely to have control over their daily tasks, work methods, pace of work, schedules, and use of technology. For example, for basic work routines (such as control over tasks, tools, procedures, and pace of work), between one quarter and one third of managers in residential centers said that their employees had a lot or complete control; about twice as many managers of middle market centers reported their employees had discretion over these areas of work.

Figure 2.5a Percent of Workers with Discretion Over: Daily Tasks, Pace/Speed and Lunch Breaks.



It is noteworthy, however, that there are some areas in which even middle market agents have very little control. These areas include setting work objectives, revising work methods, and influencing the design or use of technology. “Offline” problem-solving teams — such as quality improvement teams that meet on a regular basis to solve problems — have become widespread in American industry. Our study finds that the telecommunications industry is no exception. On average, 90% of all respondents reported using these types of groups. However, the “penetration rate” of these teams — that is, the actual percentage of the workforce that participates in these meetings — varies widely across worksites from 1 percent to 100 percent. Where management does make use of teams, on average about 55 percent of the workforce actually participates. These meetings provide employees with the opportunity to solve specific problems as well as to discuss and learn about the on-going changes in products, technologies, procedures, regulations, and customers they serve. They also provide employees with some relief from the tedium of continuous phone work. In workplaces that use offline teams, the average quit rate is 13 percent, compared to 22 percent in workplaces without these teams.

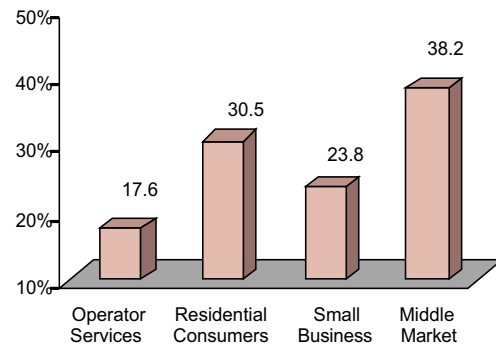
Figure 2.5b Use of “Offline” Problem-Solving Teams by Market Segment.



In contrast to offline problem-solving groups, only a minority of the managers in the study reported using self-directed work teams. The use of self-directed teams does vary by segment, with high

use in higher value-added business segments; but the differences are not statistically significant, indicating that there is great variation in their use within each segment. Where service centers do use self-managed teams, 58 percent of the workforce, on average, is organized into teams.

Figure 2.5c Use of Self-Managed Teams.



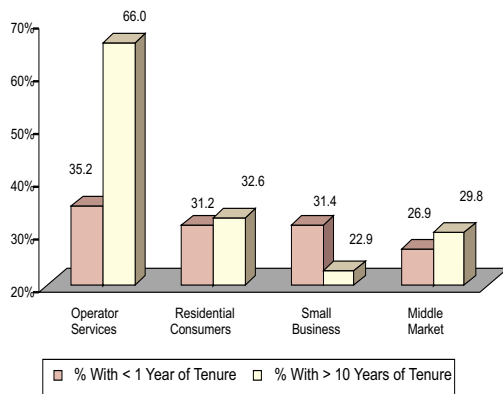
This lack of adoption of self-directed teams is somewhat surprising, given the fact that a growing body of research has found significant performance improvements associated with their use. It could be that some believe that teams are unnecessary in an environment where sales workers primarily interact with customers on an individual basis. However, recent research has found that teams in residential services have 15-20 percent higher sales than traditionally supervised work groups (Batt 1999). Employees in teams appear to learn more from each other, find better ways to handle problem customers or sell more, and are better able to keep up with the rapidly changing information and the new technologies that they must manage. In the current study, we found that those workplaces with self-directed teams had an average quit rate of 11 percent, compared to 16 percent among those that do not use these teams.

2.6 Promotions and Incentives

In this study, a substantial minority of employees

(39% on average) are promoted from within and a quarter or more have at least 10 years of company tenure. This pattern does not vary substantially across the segments. Between 23% and 35% of the workforce has less than one year of tenure on the job, reflecting the dynamic growth in organizations as well as the tightness of labor markets.

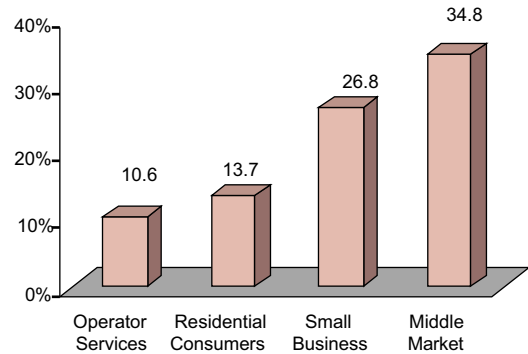
Figure 2.6a Percent of Employees With Less Than 1 Year Tenure, With Greater Than 10 Years Tenure by Market Segment.



Approximately another third has between 1 and 10 years of experience, and a final third has more than 10 years of tenure. Significant differences between union and nonunion establishments are reported in Appendix B.

Incentive and pay systems are very different for lower and higher-skilled employees. Variable pay, based on performance or commission, is much more common for employees serving the middle market. Middle market reps have 3.3 times more pay at risk than operators, and 2.5 times more than residential agents.

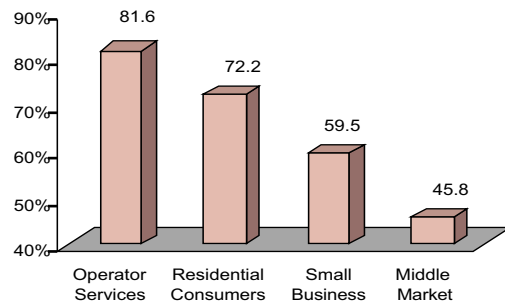
Figure 2.6b Percent of Pay That Is Variable by Market Segment.



2.7 Staffing Strategies: Use of Alternative Staffing, Gender Composition

Workforce characteristics and approaches to staffing vary systematically across these distinct segments — in terms of the size of the workforce, the gender composition, and the percent use of part-time and temporary staffing.

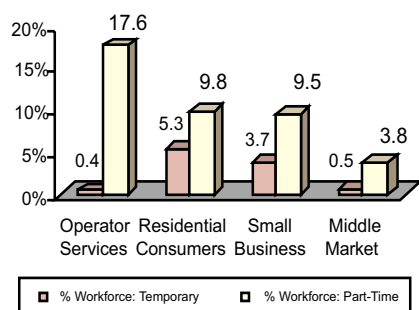
Figure 2.7a Percent Of Workforce That Is Female by Market Segment.



The use of part-time and contingent staffing patterns tends to be concentrated in lower value added services. In this study, we found that

operator, residential, and small business centers are significantly more likely than middle market centers to use part-time and temporary workers, reflecting greater cost pressures in lower value-added segments. Moreover, the use of part-time employees is considerably more prevalent than the use of temporary workers. Thus, the percent of the workforce that is part-time ranges from 17.6% in operator services to 3.8% in the middle market. Temporary workers comprise 5.3% of the workforce in residential services, but less than 1% in the middle market. They are surprisingly rarely used in operator services as well.

Figure 2.7b Staffing Strategies: Percent Part-time and Percent Temporary by Market Segment.



2.8 Turnover, Sales Growth, and High Involvement Systems

Research in manufacturing has shown that the use of high involvement work systems leads to better organizational performance (Appelbaum and Batt 1994; Ichniowski, et. al., 1999; Appelbaum, et. al., 2000). To understand whether high involvement systems lead to better outcomes in call centers, we first analyzed how each HR practice affects annual turnover rates. We found that the use of electronic monitoring significantly raises quit rates, while the use of information technology as a resource significantly lowers quit

rates. Also, those establishments that provide more discretion to their employees or use offline problem-solving teams or self-directed teams have significantly lower quit rates. Then, we developed an additive index of high involvement work practices. This includes: hiring higher skilled employees, more use of technology as a resource and less electronic monitoring; more discretion to meet customer needs; and less use of part-time and contingent staffing arrangements. When taken together, the high involvement work practices significantly lower quit rates, and the effect was much greater than the individual practices taken alone. These patterns held across all service and customer segments.

We then did the same analysis for sales growth in the residential, small business, and middle market segments. We found quite similar results, with high involvement systems having a significant positive influence on sales growth. Also, higher turnover rates were associated with lower sales growth. Thus high involvement practices influence sales growth directly (by employees ability to serve and sell to the customer) and indirectly (by influencing quit rates). The surprise finding is that even for residential customers in mass markets, the high involvement strategy produced better results. This result is notable because, as shown above, most firms have taken a production line approach to management in residential services (see Batt, 2000a, for a full account of this analysis).

In sum, this research suggests that the production line approach doesn't "fit" the complexities of serving today's residential service market. Given the wide variety of products and services in today's market, firms want to compete on the basis of bundling services — or "mass customization". To do so, however, requires investment in human resources. The variety and customization options available for today's mass market products call for better skilled workers who know the products and have the opportunity to respond to customers

as needed. High involvement work systems provide the skills, the opportunities, and the incentives to help employees serve customers well and contribute to firm performance and competitiveness.

2.9 Patterns Among Union and Non-union Workplaces

This study also examined some of the similarities and differences between union and non-union call centers. Unionization is significantly higher in operator service centers (35%) and residential centers (22%), and much lower in higher value added markets (less than 5% in the middle market). However, the percent of the workforce that is unionized is much larger in each case because larger establishments are more likely to be unionized. Thus, in this sample, 46 percent of operators belong to unions, and roughly 40 percent of those in residential and small business services, but only 8% of middle market representatives are unionized.

The tables in the appendices provide more detailed information on union and non-union workplace practices. In general, employees in non-union workplaces tend to serve more customers per day and have shorter call handling time. Unionized establishments complete more calls while the customer is on line. The non-union workforce has somewhat higher formal education, and the union workforce has greater on-the-job work experience and tenure. Self-directed teams are slightly more prevalent in non-union workplaces, while “offline” teams are more prevalent in union establishments.

Differences are greatest with respect to staffing

practices, training, pay, and turnover rates. Union establishments rely significantly less on part-time and contingent staffing. They invest significantly more in training, pay higher wages, and experience lower turnover rates.

Figure 2.9a Median Total Compensation (in 000's) - Union and Nonunion by Market Segment.

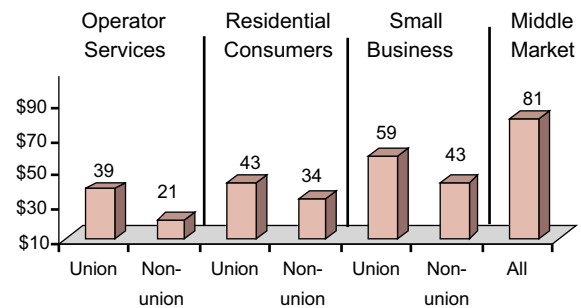
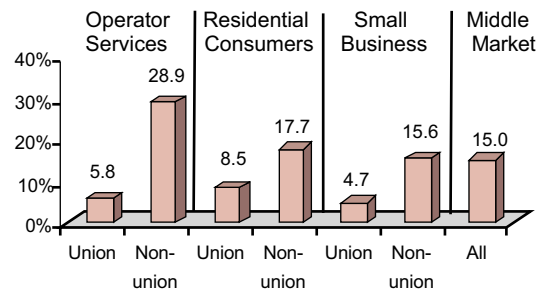


Figure 2.9b Turnover Rates - Union and Nonunion by Market Segment.

3.1 The Information Highway



3.0 Network Operations

This section provides the first glimpse of the human resource policies and work practices that guide the work of the technicians who support the network that is the backbone of the information highway. This part of the study reports on the employment practices affecting technicians employed by the network service providers in wireless, cable television, local exchange, long distance, customer premise equipment, and internet service providers. But before getting into detailed survey findings, first some background is provided on the ongoing digital transformation.

The digital transformation is changing the way we do business, carry out our lives, and interact with each other. Virtual markets are being created to more efficiently trade goods and services. At the core of this electronic information revolution are the telecommunications networks. They provide the basic infrastructure for advanced information services, whether video, voice, or data. Access to these networks is supplied by more than 305 million telephone access lines, almost three times the number of access lines that were available at the 1984 AT&T divestiture. Telephone access lines range from POTS (plain old telephone service) to SONET rings that provide high-capacity and high-speed access to multi-service networks for large business customers, governments, and universities. Wireless services now account for 21% of access lines. There were over 85 million wireless subscribers in February 2000, for a service that was offered for the first time in 1982. Shortly, substantial numbers of cable television providers will also supply network access by converting some of their 67 million cable

television lines from unidirectional broadcast feeds to broadband access lines, capable of handling internet, voice, and video. At the time of this report, the cable television industry was providing only 130 thousand access lines, a number that is projected to grow to 35 million by 2005.

Once telecommunications traffic gains access, it is routed over networks that are increasingly comprised of high capacity fiber optic backbones linked together by high-speed switches and routers. These backbone networks are owned and managed by the local exchange carriers and the facilities-based long distance companies, mainly AT&T and MCI-WorldCom-Sprint, that increasingly act as bandwidth wholesalers to resellers and other service providers. As the incumbent tele-communications providers have transformed themselves, new telecommunications services have emerged.

Since its commercial launch in 1995, the Internet has outstripped the growth of wireless, doubling in size every 100 days. The Internet industry is comprised of over 5000 service providers supporting over 80 million internet users. The internet provider industry relies mostly on the existing telecommunications networks and infrastructure to provide internet service. For example, AOL, the largest internet service provider, leases its network facilities from MCI-WorldCom.

3.2 Networks

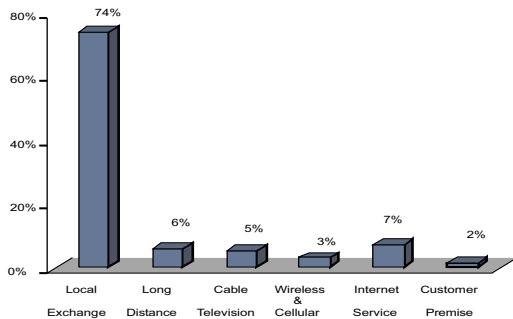
Across the different network architectures and services, there is considerable variation in network

technicians' pay and work practices. Nevertheless, some networks share several features.

In this section, we contrast the traditional Bell System employment practices, still embedded in the local exchange carriers, with the human resource practices of the wireless and internet service providers. Approximately three-quarters (74%) of the telecommunications technicians covered by this survey work for the local exchange companies. This industry segment remains under the control of the Bell System progeny and is still highly concentrated with respondents indicating that their surveyed sites retain a 94% market share. The dominant companies in this network segment are SBC, Bell Atlantic-GTE, BellSouth, and US West.

Figure 3.2a Employment Sample by Network Type.

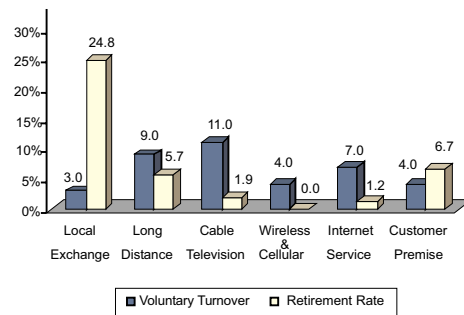
The local exchange carriers employ the most



experienced technicians in the industry with 66% of technicians having more than 10 years tenure. There are several other interesting features of their staffing practices. Local carriers have the lowest level of annual rate of voluntary turnover at three percent and the highest rate of retirements at 25% in the last five years. They have hired 29% of their work force in the last five years, which is below the industry average of 35%. They employ a disproportionately large number of field

technicians, approximately 81% of the local carrier technicians work in the field, compared to 74% in other segments of the industry. Local carriers also employ the least educated technicians, who on average have a high school education (12.8 years), and they provide the most initial training with 61 hours. Local carriers are also the most heavily unionized segment of the industry with 97% of the technicians being represented by a union.

Figure 3.2b Rate of Voluntary Turnover & Retirement (in the last 5 years) by Network Type.



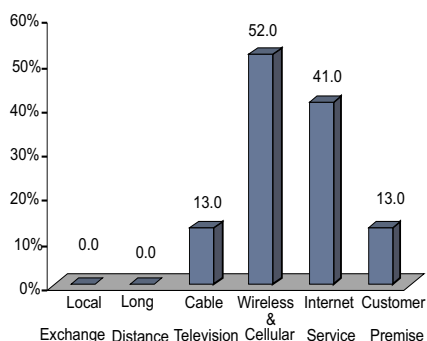
3.3 Organizational Practices and Strategies

3.31 Internet Service Providers, Wireless & Cellular Networks

The newer network establishments, wireless and internet service providers, have implemented many contemporary nonunion human resource management practices. They also employ the most educated technicians in the industry with wireless technicians averaging 14.82 years of education and ISP technicians having 14.76 years of schooling. They also employ the highest ratio of college graduates with 41% of ISP technicians being college educated and 52% of wireless technicians with a college degree compared to an industry average of 6% of technicians holding college degrees. The rapidly growing wireless industry has the most inexperienced technicians

with 79% of wireless technicians having less than 10 years tenure while in the ISPs 63% of technicians have less than 10 years experience compared to an industry average of 43% of technicians with less than 10 years service. Although 76% of the industry's technicians are union represented, the newer network establishments are unlikely to be union represented with 8% union coverage in wireless and 10% among ISPs. A greater proportion of the technicians at the newer networks are also exempted from federal labor laws, with 29% exempted in wireless and 20% among the ISPs compared to 7% in the industry.

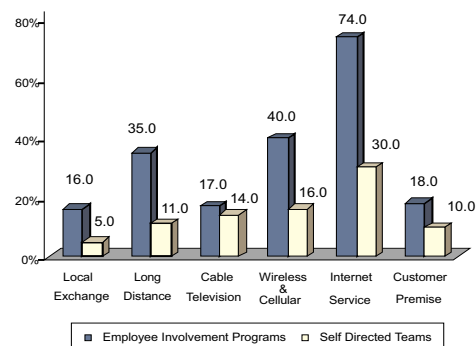
Figure 3.31a Percent of College Graduates by Network Type.



The newer network establishments also make greater use of offline problem solving teams (74% ISPs and 40% wireless technicians, compared to an industry average of 21%) and self-directed work teams (30% ISPs and 16% wireless technicians, compared to an industry average of 8%), but they also are more likely to electronically monitor their employees with 52% of ISP and 32% of wireless technicians monitored electronically, compared to an industry average of 24%. The newer network establishments employ more office-based technicians; 90% of ISP technicians work in offices, and 32% of wireless technicians work in offices, compared to an industry average of 26% of technicians based in offices. Since newer network establishments

have a relatively low tenured workforce, they have had few retirements in the last five years; with no technician retirements from wireless and 1% from ISPs compared to an industry average of 20% retirements in the last five years. Newer network establishments have engaged in more hiring than average with ISPs hiring 50% of their technicians and wireless hiring 43% compared to an industry average of 35%. Both ISP and wireless technicians work in relatively small establishments. The average ISP establishment surveyed employs 70 people and the average wireless establishment surveyed employs 85 people compared to an industry average of 461 employees per establishment. The newer network establishments also provide less than half the amount of qualifying training for their technicians compared to the industry average. ISPs provide 28 hours of qualifying training and wireless networks provide 22 hours of qualifying training compared to an industry average of 56 hours of qualifying training. Neither of the newer network establishment types, however, are likely to have an on-site human resources representative with only 26% of ISP technicians working in locations with an HR representative and 40% of wireless technicians compared to an industry average of 60% of establishments with an on-site human resources representative.

Figure 3.31b Use of Offline Problem Solving Practices & Self Directed Teams by Network Type.

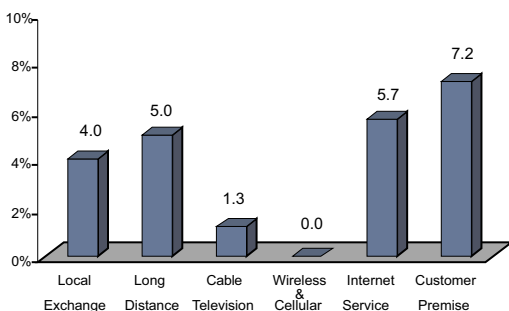


With regard to a variety of other staffing and compensation practices, ISPs and wireless service providers differ significantly from one another. The rapidly growing ISPs are more likely to rely on internal promotions with 65% of vacancies filled internally compared to wireless with 43% filled internally and an industry average of 54%. ISPs have had some downsizings, losing 6% of their employees, where wireless has had no layoffs. The ISPs make much greater use of variable pay devoting 13% of compensation to variable pay plans, compared to an industry and wireless average of 4%. ISPs also make much greater use of temporary employees, approximately 14% of their technicians are temporary, compared to wireless, which uses no temporary technicians and an industry average of 3%. Similarly, ISPs use part-time employees in technical positions, approximately 6%, whereas wireless uses no part-time technicians and the industry average is 1% part-time employment in technical jobs. Wireless technicians are significantly more likely to trust their employer, some 95%, compared to an industry average of 79% and an ISP average of 81%. One possible explanation for the differences in trust is that wireless companies have had the most stable ownership in the industry with only 19% having changed ownership in recent years, while over half (54%) of the ISPs have changed ownership, considerably above the industry average of one-third (32%).

3.32 Long Distance and Local Exchange Carriers

In the past, when the long distance market was dominated by AT&T, establishments in that market segment had the same human resource practices as the local exchange carriers. In contrast, long distance carriers are now largely nonunion with only 12% of long distance technicians union represented. The major facilities based-carriers, AT&T and MCI-WorldCom-Sprint, are supplemented by a myriad of service resellers. Long distance establishments report an average market share of 21%. Long distance carriers have the most advanced network technologies with 53% of their entire networks fully digital. Approximately 34% of their technicians work in offices rather than in the field and 37% are electronically monitored. Long distance carriers rely least on internal promotions with only 30% of vacancies filled internally and they utilize more temporary employees (7%) than the industry average or the local exchange carriers. Approximately one-quarter of employee pay is variable in the long distance carriers, significantly more than the industry average (4%). Long distance has undertaken more major reorganizations, exceeding by more than one per year (5.6 in five years) more than any other network service. The long distance network providers are comparable to the local exchange carriers with regard to the education and training of their technicians. Long distance technicians have 13.5 years of education and are not working in facilities that require a college degree. They receive 59 hours of initial training, which is above the industry average of 56 hours. In contrast to the local exchange carriers, only 31% of long distance technicians have 10 years service and these technicians have a relatively high annual voluntary turnover rate of 9%.

Figure 3.31c Layoffs In The Last 5 Years by Network Type.

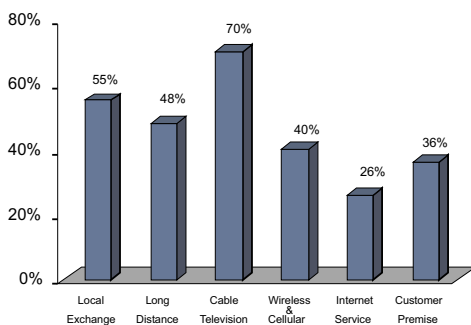


3.33 Customer Premise Equipment

Another segment of the telecommunications industry formerly dominated by the Bell companies

is the customer premise equipment (CPE) business. This market segment is now comprised of many small contractors, who were outside the scope of our survey, and several large firms. They supply PBX and other customer premise network equipment, mostly to large organizations. Lucent Technologies, Nortel, and Siemens are the largest manufacturers of this equipment. They rely on either their own technicians or vendors to undertake installation and maintenance work. The large employers within the CPE industry segment are 66% unionized. There are several other distinguishing features about their human resource practices. These technicians do not receive variable compensation, nor are they likely to receive internal promotions since only one-third of vacancies are filled internally. They work in the smallest organizations in the overall industry and are unlikely to work in an organization that has a human resources department (36%). Some of the contractors in this market segment have IBEW hiring hall contracts, where the union supplies qualified and trained teledata technicians who undertake projects.

Figure 3.33a Percent of Organizations With a Human Resource Department by Network Type.



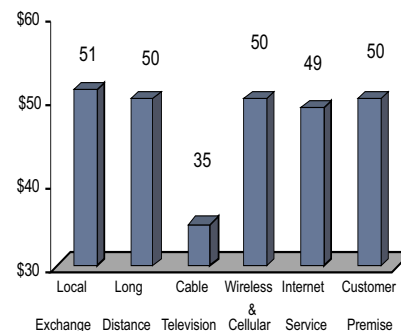
3.34 Cable Television Networks

AT&T's acquisition of TCI and Media One transformed the largest long distance company into the dominant cable television provider.

Technicians in the cable television industry, however, work under dramatically different circumstances than do technicians in long distance. Cable television pays its technicians approximately 30% less than any other network establishment, even though the cable firms face relatively little competition in their local markets as they average a 73% market share.

Cable television has the highest rate of voluntary turnover at 11% annually, it uses temporary employees (8%) at twice the industry average, and it has technicians with relatively little experience with 73% of cable technicians having less than 10 years experience, even though cable television has the oldest establishments in the industry (1977 founding on average). Two-thirds (68%) of cable television technicians work for establishments that have changed ownership in the last five years. Nevertheless, according to the management respondents, 96% of cable television technicians trust their employer, significantly more than the industry average of 79%. Cable television technicians receive half the qualifying training that other technicians in the industry receive (28 hours compared to 56 hours). Over one-third (37%) of cable television technicians home garage their company vehicle.

Figure 3.34a Average Annual Total Pay (in 000s) by Network Type.



As cable television is transformed from a

unidirectional broadcast medium into a conduit for high-speed network access, we suspect that there will be a strong need to upgrade the human resource practices and pay of the technician workforce. A central question confronting the cable television industry will be what role, if any, unions will play in achieving the necessary transformation of work and pay practices.

3.4 Influence of Union Status on Work and Human Resource Practices

Telecommunications remains a relatively densely unionized industry: 76% of technicians covered by this survey are represented by unions. On the other hand, only 36% of the establishments surveyed were union represented; highlighting that unions represent relatively large workplaces. Unionized technicians earn more than their nonunion counterparts, approximately 7% in base pay and 10% in total pay. When controlling for other factors that influence wage determinations, statistical analysis indicates that there is a 15% union wage premium. On average, nonunion technicians are more educated with 14 years of education versus 13 years for union workers. Also, 23% of nonunion technicians are employed in establishments that are comprised of college-educated workers, while no union technicians work in such workplaces. Union technicians are much more experienced than nonunion workers. On average, 68% of union technicians have more than 10 years tenure, while only 26% of nonunion workers have 10 years with the same employer. This longer retention of union technicians is associated with employers providing 50% more qualifying training to union workers compared to nonunion technicians. Four out of five union technicians work in the field whereas only one out of two nonunion technicians work in the field. Most of the network characteristics and communications tools vary in conjunction with the differences in office and field status.

Ninety-five percent of union technicians work for the local exchange carriers, which employ 74% of the technicians in the industry. The nonunion workforce is based in long distance, cable television, internet service providers, and wireless communications. Unionized technicians work for firms that still dominate their markets (they average a 93% market share) when compared to firms that employ nonunion technicians (35% market share on average). All union employees work in branches of larger organizations, whereas 93% of nonunion technicians work in branch facilities.

Figure 3.4a Union and Nonunion Technicians: Less Than 1 Year Experience; Greater Than 10 Years Experience.

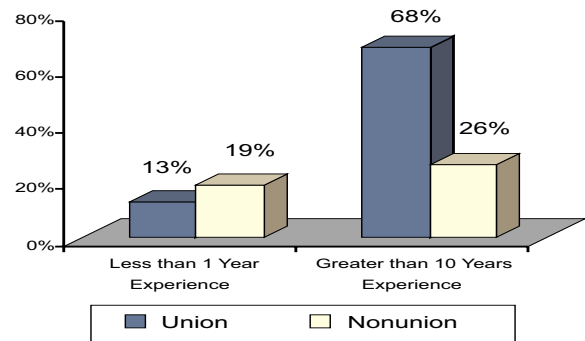
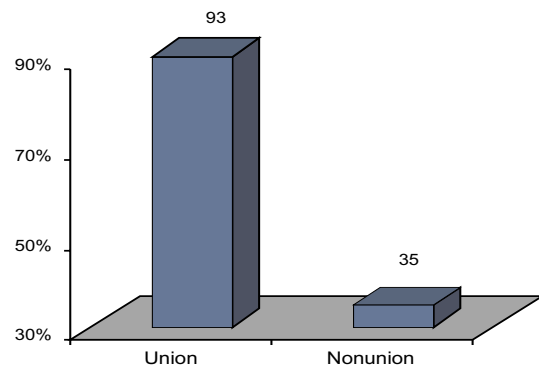


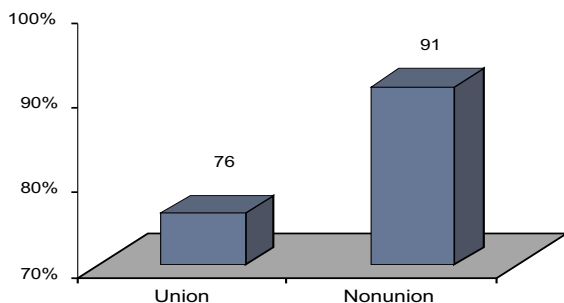
Figure 3.4b Rate of Market Share: Union vs. Nonunion Technicians.



Nonunion workplaces have more likely changed ownership in the last five years (44% vs. 29%). Nonunion workplaces hold a slight edge on reorganizations during the last five years with one more per year (5 vs. 4), and they are more likely to have a human resources department located in the field (78% vs. 55%).

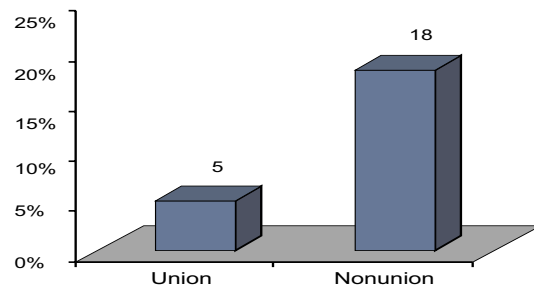
Human resource practices significantly vary by union status. Unionized workplaces are more likely to rely on internal promotions to fill vacancies (56% vs. 46%); they make virtually no use of part-timers (0% vs. 2%); they have significantly fewer voluntary quits (3% vs. 11%); they have three-times more workers retiring in the last five years (36% vs. 12%); they have half the layoffs (3% vs. 6%); they rely on significantly fewer temporary employees (5% vs. 13%); and they rely less on variable pay plans (2% vs. 11%). Nevertheless, union technicians trust their employers less according to their managers (76% vs. 91% of nonunion workers).

Figure 3.4c Level of Trust: Union vs. Nonunion Technicians.



Nonunion technicians are more likely to participate in offline problem solving plans (42% vs. 15%), self-directed teams (18% vs. 5%), and home garage their vehicles (25% vs. 12%). Many union leaders believe these practices are driven by union avoidance motives, and not by concerns for improving the performance of already highly skilled and autonomous technicians.

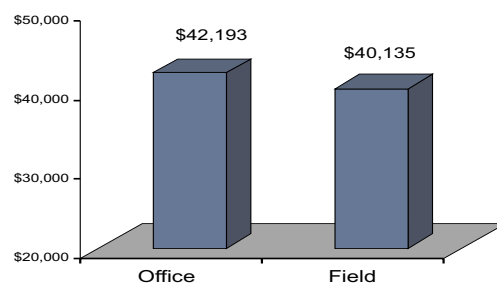
Figure 3.4d Use of Self Directed Teams: Union vs. Nonunion Technicians.



3.5 Network Technicians in the Office and in the Field

As network technologies advance employee skill sets evolve. The office has become the central institution for post-industrial work in the telecommunications industry. Electronic sensors allow comprehensive surveillance of the network by the network operations centers. Work formerly done in a field setting on network equipment can increasingly be performed either by computers running self-healing routines or by employees in offices manipulating software commands. Moving work from the field to the office is often associated with significant labor savings. Consequently, 74 percent of the technicians covered in our survey work in the field, the industry segment least susceptible to labor saving automation.

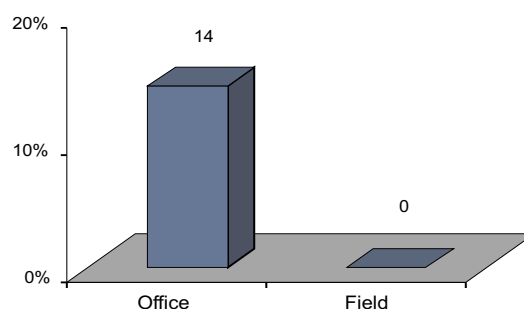
Figure 3.5a Average Annual Total Pay: Office vs. Field Technicians.



Technicians who work in offices annually earn two-thousand dollars more than field technicians. One in five office technicians works in an operation that requires a college degree, whereas only one-percent of field technicians work in organizations requiring a college education. Office technicians have close to one more year of education (13.63) than field technicians (12.86). One in four office technicians is female, while one in twelve field technicians is a woman. Over four out of five field technicians are union represented, whereas, three out of five office technicians are in a union represented bargaining unit. Office technicians are more likely to be exempt from federal labor laws (12%), compared to field technicians (5%). Office technicians are significantly more likely to participate in offline problem solving teams and also are more likely to be monitored electronically as compared to field technicians. Office technicians are more likely to get an internal promotion (68% vs. 48%), are more likely to be working part-time (14% vs. 0), are in work groups that have experienced fewer retirements in the last five years (8% vs. 25%), and are in work groups that have been doing more hiring of new employees (52% to 30%). Three out of four office technicians work for an organization that has changed

ownership in the last five years, compared to less than one out of five field technicians. Office technicians are significantly more likely (93%) to work at a site with a human resources department, compared to less than half of field technicians (47%). Office technicians receive one-third less initial training (41 hours) than field forces (61 hours). Local exchange carriers employ 57% of office technicians and 83% of field technicians, whereas our sample of internet service providers indicated that they employ one-quarter (26%) of office technicians, but hardly any field technicians (1%).

Figure 3.5b Use of Part-Time Employees: Office vs. Field Technicians.



4.0 The Managerial Workforce

This section of the report examines outcomes related to managers in the surveyed telecommunications establishments. We focus on four variables: the level of managers' annual pay, manager pay relative to average worker pay, the percent of managers in the workforce, and the average number of workers supervised. For the first three of these measures the data concern managers at the establishment level, excluding first line supervisors. Thus those data exclude managers who directly supervise frontline workers. The data on the number of workers supervised deals with front-line supervisors.

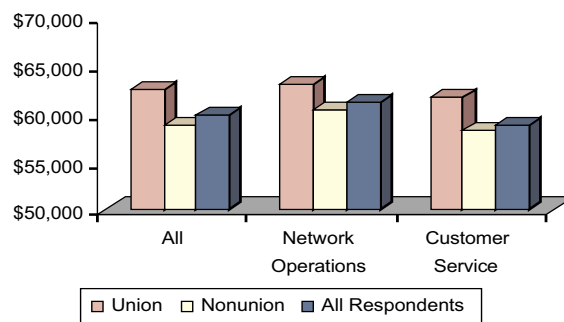
The data reported in the figures that follow are compared on the basis of whether the establishment was union versus nonunion, and whether the primary work activity was network operations versus customer service and sales. We also examine differences in managerial pay within customer services, according to whether the targeted market segment is the middle market, small business, residential consumers, or operator services. Within network operations, we compare managers of central office technicians versus field technicians.

4.1 Level of Manager Pay

Figure 4.1a reports the average pay of managers where pay includes annual wages but excludes any overtime, performance-based pay, or benefit payments. Average annual pay is \$62,509 in unionized establishments and \$58,926 in non-union establishments. Across union and non-union settings, on average, managers earn somewhat more in network operations versus customer service and sales. The figures also show that manager pay in union establishments ranges between 4.5 and 6% more than pay in non-union establishments depending on the primary work activity (the differential is lower in network

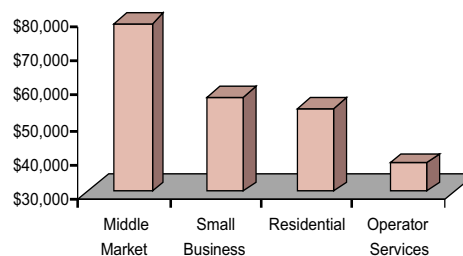
operations as compared to customer service and sales). Additional benefit costs for managers are reported at 24% in non-union establishments, but 31% in union establishments.

Figure 4.1a Average Manager Pay: Union vs. Nonunion.



In customer service and sales operations, managerial pay varies sizably across centers that target different market segments (Figure 4.1b). In establishments that target the middle market, managers earn \$78,636, compared to their counterparts in small business centers who earn \$57,248, and those in residential services who earn \$54,058. Managers in Operator Services, by contrast, earn \$38,058.

Figure 4.1b Average Manager Pay by Market Segment — Customer Service & Sales.



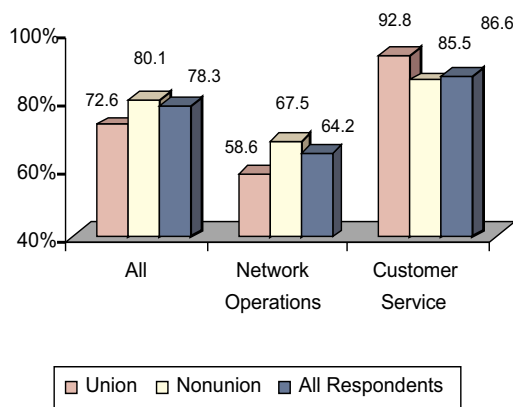
We surmise that manager pay in residential establishments is lower in part because the work is more routine. Also, managers in the middle market are likely to earn more because the sales agents there earn more.

In network operations, the salary differences are less accentuated: while managers in central office operations earn \$62,458, those managing field staff earn \$60,914.

4.2 The Relative Pay of Managers Compared to Average Worker Pay

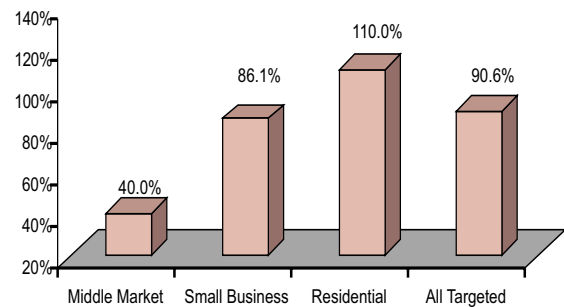
Managers earn 67.5% more than workers in non-union network operations and 58.6% more than workers in union network operations (Figure 4.2a). The non-union manager to worker pay differential may be larger due to the relatively lower pay received by workers in non-union establishments. In customer service and sales establishments, the manager-to-worker pay ratio is even higher, and the differential is larger in unionized settings (92.8%) than it is in non-union establishments (85.5%).

Figure 4.2a Incremental Managers' Pay, Relative To Average Worker Union vs. Nonunion.



Manager-to-worker pay differentials vary sizably across the various market segments in customer service and sales. Manager pay is 110% greater than worker pay in residential call centers, and respectively, 86.1% and 40% greater in small business and middle market centers. These differentials may reflect both differences in the complexity of managerial responsibilities and differences in worker pay across customer segments (Figure 4.2b). In contrast to this variation across market segments, the manager-to-worker pay differentials in central office and field settings are not remarkably different.

Figure 4.2b Incremental Managers' Pay, Relative to Average Worker by Market Segment—Customer Service & Sales.

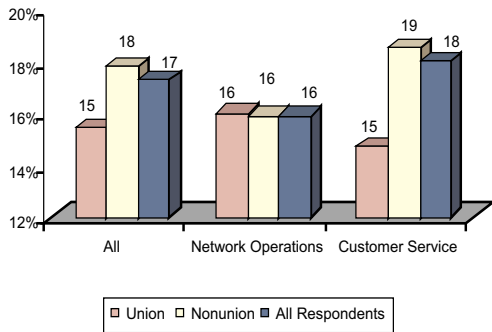


4.3 The Percent of the Workforce that is Managers

In the next set of charts, we examine the percent of the workforce that is managerial. This issue is of interest because many organizations have attempted to reduce managerial ranks in order to decentralize decision-making and increase the percentage of the workforce that carries out direct production activities. Managers constitute 18% of the workforce in service and sales establishments and 16% in network operations. Figure 4.3a shows that managers constitute a relatively higher percentage of the workforce in

non-union call centers (19%) and relatively lower in union centers (15%). There is not a sizable difference in the percent managers between union and non-union network operations establishments.

Figure 4.3a Percent of Managers in Workforce.

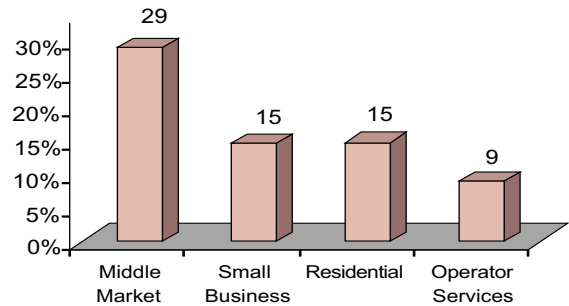


In customer service and sales operations, the variation in the percent of the workforce that is managers is substantial, ranging from 29% in those centers targeting the middle market to 9% in operator services. In small business and residential centers, the comparable figure is 15%. The small percentage of managers in operator services may reflect the high level of automation in work processes and the use of electronic monitoring for performance management. The high relative percentages of managers in the middle market and non-union establishments are more difficult to explain. One explanation is that middle market centers and non-union establishments are less automated and rely less on electronic monitoring. Thus, they use more managers rather than advanced technologies. An alternative explanation is that greater numbers of workers are classified as managerial either to avoid their potential unionization or to lessen union influence.

Surprisingly, however, the pattern is reversed in network operations. In the field offices where jobs are hard to monitor because technicians are

working in dispersed field sites, only 12% of the workforce is managerial. In central offices, by contrast, the percentage is 20%. The pattern here may be related to unionization, as only 19% of the central offices are unionized, but 48% of the field offices are union.

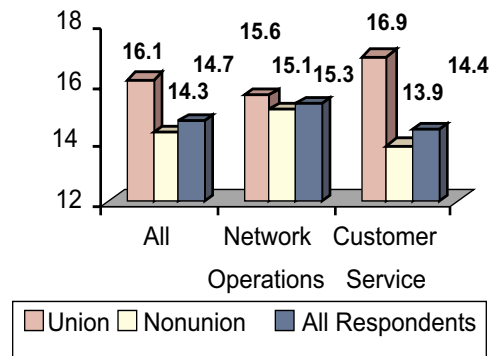
Figure 4.3b Percent of Managers in Workforce by Market Segment Customer Service & Sales.



4.4 The Span of Control of Front-line Supervisors

Another important difference in the way work is organized across the various establishments is the number of workers that report to each supervisor.

Figure 4.4a Supervisor Span of Control: Union vs. Nonunion.

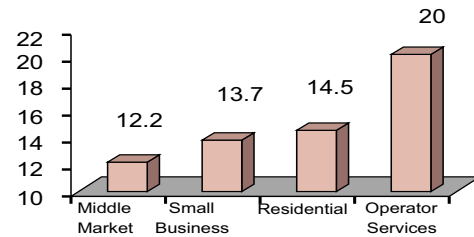


As is the case with the managerial workforce in general, many firms have sought to reduce the number of supervisors, increase spans of control, and decentralize decision-making to frontline employees. Note that here, in contrast to the other data reported in this section, we assess the span of control of front-line supervisors and not other managers. Figure 4.4a reveals that the number of workers per front-line supervisor is higher among union versus non-union establishments; and it is especially low (13.9) among non-union customer service and sales oriented establishments.

Figure 4.4b examines the use of supervisors in more detail, within customer service and sales. The pattern we find is similar to that described above with respect to the percentage of managers in the workforce. While supervisors oversee about 12 employees in middle market call centers, that figure jumps to 15 in residential centers and 20 in operator services. Similarly, supervisors oversee 14 employees in central office operations but 17 in

network field locations. In customers services, these patterns may be due to the extensive use of electronic monitoring in the low value added centers.

Figure 4.4b Supervisor Span of Control by Market Segment—Customer Service & Sales.



This argument is harder to make for the network field technicians, although the use of hand-held computers as a vehicle for electronic monitoring has provided the opportunity to reduce supervisory ranks among this group of workers as well.

5.0 Dispute Resolution Procedures

5.1 Dispute Resolution

In this section, we focus on dispute resolution procedures. A sub-sample of 302 establishments answered questions in a supplemental survey dealing specifically with dispute resolution. Recent years have seen growing interest in dispute resolution in the nonunion workplace. Part of this interest has been inspired by the expansion of legal protections of individual employee rights. In addition, the Supreme Court's decision in *Gilmer v. Interstate/Johnson Lane* 500 U.S. 90 (1991) has provided an impetus to the introduction of nonunion arbitration procedures. At the same time, declines in the rate of unionization have focused attention on the questions of the extent of dispute resolution procedures in nonunion workplaces and how these nonunion procedures compare to union grievance-arbitration procedures. Among the 302 respondents to the dispute resolution survey, 33% of the establishments had at least some unionized employees, whereas 67% were entirely nonunion.

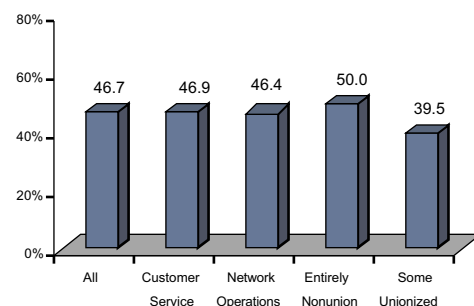
5.2 Distribution of Dispute Resolution Procedures

5.2.1 Incidence of Procedures for Nonunion Employees

In contrast to the near universality of grievance-arbitration procedures in the unionized workplace, a basic question for nonunion employees is whether or not their establishment has any kind of formal dispute resolution procedure at all. We find a little less than one-half of all establishments have some type of formal dispute resolution procedure covering their nonunion employees. Formal procedures are equally common in customer service and network operations establishments. However, the incidence of formal

dispute resolution procedures covering nonunion employees is lower for establishments where at least some of the employees are unionized. (This latter category includes the common situation where hourly employees are unionized, but managers or exempt employees are nonunion.) One explanation for this difference may be that many nonunion dispute resolution procedures are introduced to provide a substitute for union grievance-arbitration procedures and thereby reduce the demand among employees for unionization. Where all (or many) of the eligible employees in the establishment are already unionized, this union substitution motivation for the introduction of procedures will no longer be relevant, thereby reducing the likelihood of the employer introducing a procedure covering the remaining nonunion employees (Colvin, 1999).

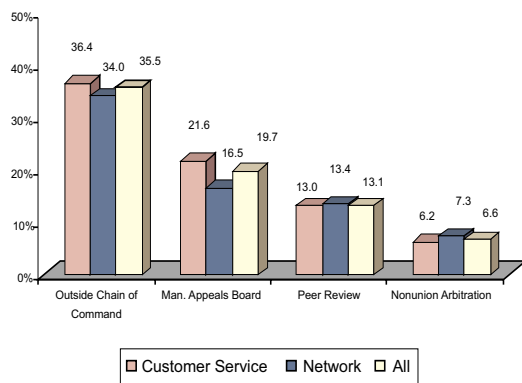
Figure 5.21a Percent of Establishments with Formal Dispute Resolution Procedures For Nonunion Employees.



Relatively well-developed dispute resolution procedures exist in most unionized workplaces, normally consisting of multi-step procedures for the resolution of grievances culminating in binding arbitration. In contrast, we find much greater diversity in the features of nonunion dispute

resolution procedures. For respondents who indicated that they had a formal dispute resolution procedure covering nonunion employees, we asked questions about the presence of four different structural features in the procedure. The most common feature is provision for review of the employee’s complaint by someone from outside of the management chain of command (35.5% of all establishments have formal procedures for nonunion employees that include this feature). Next most common are appeals boards consisting of managers who hear employee complaints (19.7% of all establishments have procedures for nonunion employees that include this feature). Least common are two features involving review of complaints by non-managers.

Figure 5.21b Percentage of Nonunion Establishments with Dispute Resolution Procedures by Procedure Type.

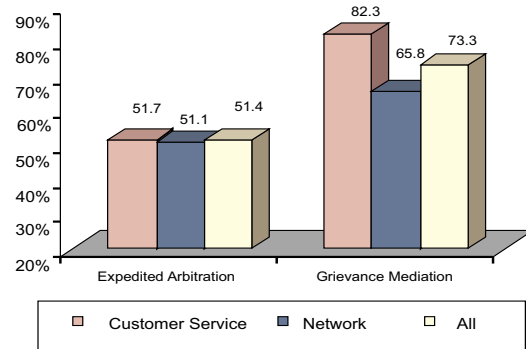


In peer review procedures, employees who are peers of the complainant are a majority of the members on a panel that review the complaint. A surprisingly large minority of procedures included this feature (13.1% of all establishments have procedures for nonunion employees that include this feature). Finally, nonunion arbitration is the least common feature (6.6% of all establishments have procedures for nonunion employees that include this feature). The finding that peer review panels are twice as common as nonunion

arbitration procedures is somewhat surprising given the attention to nonunion arbitration in the wake of the Supreme Court’s *Gilmer* decision. However, a possible explanation for this finding is that some employers may require nonunion employees to sign an arbitration agreement covering legal disputes, as permitted by the decision in *Gilmer*, but have not established formal procedures beyond the simple contractual agreement to arbitrate. Supporting this explanation, a number of employers who did not have formal dispute resolution procedures indicated that complaints by nonunion employees concerning termination or discipline were nevertheless subject to arbitration.

5.22 Alternative Dispute Resolution in the Unionized Workplace

Figure 5.22a Percent of Unionized Establishments with Alternative Dispute Resolution Procedures.

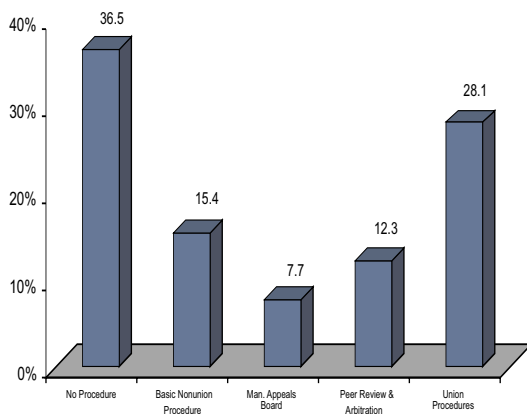


Two alternative dispute resolution techniques used as part of union grievance-arbitration procedures are common in the industry. Expedited arbitration is used in around half of unionized establishments in both customer services and network operations. Grievance mediation is even more widely used, being employed in almost three-quarters of unionized establishments. Grievance mediation is particularly common in unionized customer service establishments.

5.23 Procedures Covering Core Employees

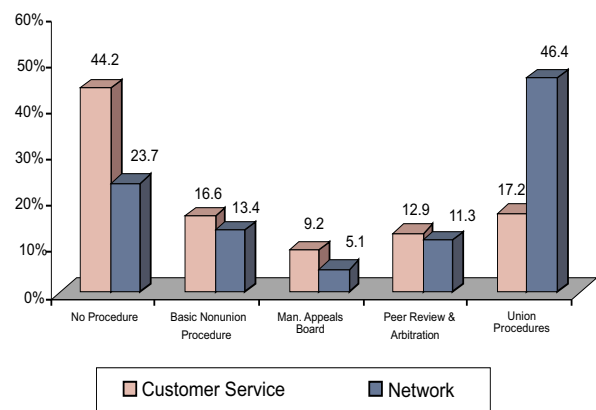
In order to increase comparability between procedures, we categorized establishments based on the type of dispute resolution procedure that covers the ‘core employees’ in the establishment. Many establishments in which the core employees are not unionized fall into the first category of ‘no procedure.’ Conflicts obviously exist and may be handled through various informal processes in these establishments, but they lack a formal procedure for employees to resolve disputes. Some establishments with nonunion core employees fall into the second category of having a ‘basic nonunion procedure.’ In contrast, establishments with nonunion core employees in the third category include a ‘management appeals board’ in their dispute resolution procedure. The fourth category consists of establishments with nonunion core employees that have included either peer review panels or nonunion arbitration in their dispute resolution procedures. Finally, the fifth category consists of establishments where the core employees are unionized and covered by ‘union procedures’ for handling grievances.

Figure 5.23a Percentage of Establishments with Dispute Resolution Procedures For Core Employees.



Procedures covering core employees vary by industry segment. Union procedures cover core employees in a much larger proportion of establishments in network operations than in customer services (46.4% vs. 17.2%), reflecting the greater extent of unionization in that segment of the industry.

Figure 5.23b Percentage of Establishments with Dispute Resolution Procedures For Core Employees — Customer Service vs. Network.



The other striking difference between segments is the much higher proportion of core employees in customer service than network operations who are covered by no procedure at all (44.2% vs. 23.7%).

5.3 Usage of Procedures

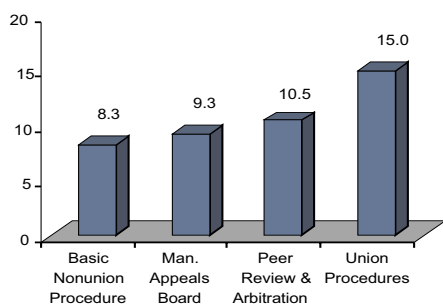
We also examined how dispute resolution procedures are used by employees. One of the concerns employers often express regarding the introduction of nonunion dispute resolution procedures is that they will encourage an explosion of numbers of employee complaints. Conversely, a criticism of nonunion procedures is that they do not provide the same degree of independent

representation and neutral decision-making as do union procedures. As a consequence employees will not trust the fairness of nonunion procedures and will not use them for complaints.

5.31 Complaint Rates

A major challenge in comparing employee usage of different dispute resolution procedures is that differences in the types of grievances covered may lead to a comparison of apples and oranges. For example, one procedure may include grievances over outsourcing of work, whereas another may not permit grievances on this issue. In order to achieve comparability in complaint rates between different types of procedures, we constructed a combined complaint rate measure based on the total number of complaints in three common categories: complaints related to hours of work and overtime; complaints related to promotion and transfer decisions; and complaints about disciplinary decisions. Using this measure, we find that complaint rates under nonunion procedures are higher where the procedures include management appeals boards and are higher again when peer review or arbitration is included in the procedure. However, even where peer review or arbitration is included in nonunion procedures, complaint rates under union procedures are half again as high.

Figure 5.31a Annual Rate of Complaints Per 100 Employees.

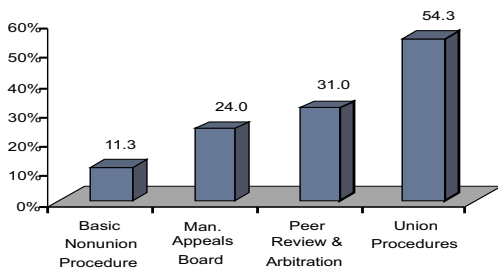


5.32 Discipline Appeal Rates

Although aggregate complaint rates provide a broad measure of the usage of dispute resolution procedures, they do not capture differences in the underlying levels of conflict that give rise to employee complaints. If procedures such as peer review or arbitration are more common features in workplaces that have relatively low conflict levels, this will lead to a lower overall usage rate, even if the proportion of potential complaints brought through the procedure is relatively high.

As a second indicator of employee usage of dispute resolution procedures, we constructed a measure consisting of the rate of appeals of disciplinary decisions as a percentage of the overall number of employees disciplined. Using this measure, we find much greater differences in usage rates between the different categories of procedures. Again, union procedures have the highest usage rates, with on average just over half of disciplinary decisions being appealed under union procedures. Usage rates are also substantial under nonunion procedures that feature peer review or arbitration, with almost a third of disciplinary decisions being appealed. Nonunion procedures featuring management appeals boards also have relatively high usage rates, whereas under basic nonunion procedures that do not include any of these three features, barely one in ten discipline decisions is appealed. These results provide a strong indication that inclusion in nonunion procedures of features (such as management appeals boards, peer review panels, and nonunion arbitration) that allow for more independent review of employee complaints do lead to greater employee usage of the procedures. However, even with these features, usage rates for nonunion procedures remain substantially below rates for union procedures.

Figure 5.32a Percentage of Disciplinary Decisions Appealed.



5.4 The Impact of Dispute Resolution Procedures

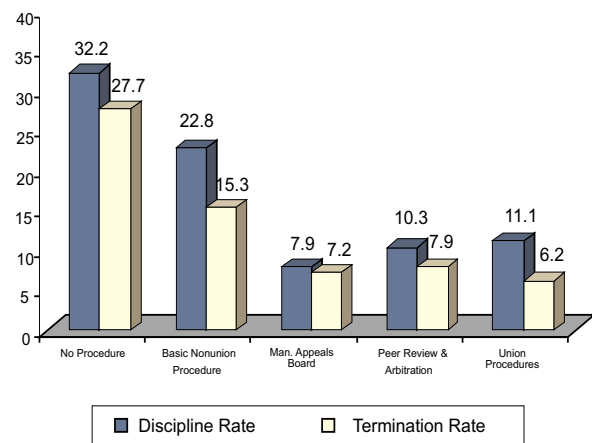
Beyond the actual usage of dispute resolution procedures, the question arises: What impact does the presence of procedures have on other types of manager and employee behavior? One possible impact of the procedures is that the potential for review of their decisions may discourage managers from disciplining or terminating employees. Alternatively, rather than simply discouraging discipline and termination decisions, the potential for review of their decisions under a dispute resolution procedure may have a salutary effect in increasing the time and care taken by managers in making such decisions. Finally, the availability of a procedure to resolve disputes on the job may reduce the likelihood that employees will respond to problems by simply quitting and trying to find alternative employment. In this section, we examine each of these potential impacts of dispute resolution procedures on employee and manager behavior.

5.41 Relationship with Discipline and Termination Rates

Annual discipline and termination rates are measured per 100 employees in the establishment. Both discipline and termination rates are highest in establishments with no dispute resolution procedure covering core employees. Discipline

and termination rates are next highest in establishments with only basic nonunion dispute resolution procedures. In contrast, both discipline and termination rates are much lower in the three remaining categories, of establishments with management appeals board, peer review panels or nonunion arbitration, and union procedures. Differences among these last three categories are less pronounced. These findings indicate that dispute resolution procedures providing more independent review of management decisions are linked to lower discipline and termination rates.

Figure 5.41a Annual Discipline & Termination Rates Per 100 Employees.



However, it must be cautioned that this may not be a simple direct effect of the potential for review discouraging discipline and termination decisions, but rather that these dispute resolution procedures contribute to a lower conflict workplace climate that also produces lower discipline and termination rates.

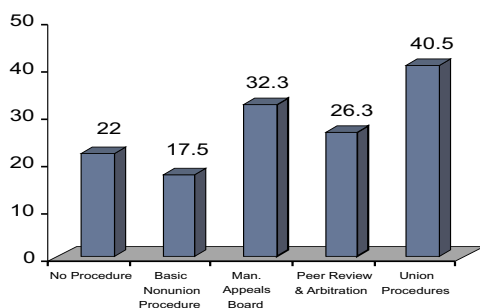
5.42 Relationship with Termination Decision-Making

The time spent on termination decisions provides another measure of the relationship between dispute resolution procedures and management decision-making. Greater time spent on termination decisions suggests greater

management caution and care in making these decisions, which have sometimes been described as the workplace equivalent of capital punishment. Conversely, some employers have criticized limitations on the process of termination as unduly interfering with their ability to hire and fire at-will which are needed for efficient operation of establishments. We find that the time spent on termination decisions does vary with the type of dispute resolution procedure covering core employees. Time spent on termination decisions in establishments where there are union procedures is around double the time spent in establishments where there is either no procedure or a basic nonunion procedure. In this area, establishments with management appeals boards and peer review or nonunion arbitration procedures fall in the middle between the more basic nonunion procedures and the union procedures. Interestingly, time spent on termination decisions where there are management appeals boards (32.3 hours) is higher than the time spent where there are peer review or nonunion arbitration procedures (26.3 hours).

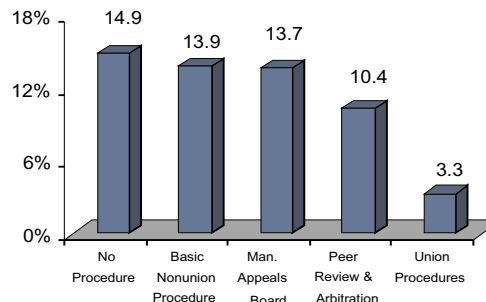
Although other factors may be involved, one possible explanation is that the prospect of having to justify a decision to a board of more senior managers who may also have influence over future career prospects is more daunting for a lower level manager than being reviewed by a peer review panel or a nonunion arbitrator.

Figure 5.42a Hours Spent Per Termination Decision.



5.43 Relationship with Quit Rates

Figure 5.43a Annual Quit Rate Per 100 Employees.



For an employee confronted with a problem on the job, two alternative responses are to complain about the problem or to quit and attempt to find more desirable employment. This ‘exit-voice’ trade-off has been much discussed by researchers, but surprisingly little evidence exists of its operation, particularly in nonunion workplaces. Dispute resolution procedures provide a potential ‘voice’ mechanism through which employees can raise complaints.

Our results confirm the well-known finding that quit rates are much lower in unionized than nonunion workplaces. However, we are also able to examine the relationship between quit rates and the presence of different types of nonunion procedures. Quit rates are lower in establishments with either basic nonunion procedures or management appeals boards than in nonunion establishments with no dispute resolution procedure, though the reduction in quit rate is only around one percent for each of these categories. In contrast, quit rates are lower by 4.5 percentage points in establishments with peer review or arbitration than in nonunion establishments with no procedure at all. Although quit rates in establishments with peer review or nonunion arbitration are still well above those in unionized establishments, this finding provides some support for the suggestion that an ‘exit-voice’ effect results from the presence of peer review or arbitration procedures in nonunion establishments.

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Appendices

Appendix A: Technical Notes

The sample is a stratified random sample drawn from the Dun and Bradstreet listing of establishments. Establishments were stratified by size (10-99 employees, 100-plus employees) by SIC code (4812, cellular; 4813, wireline; 4841, cable), and by state location. Almost all establishments with more than 100 employees were sampled so that the survey would cover a larger percentage of the industry's workforce. Sampling of the remaining smaller establishments was done so that the total sample reflects the relative proportion of establishments in each segment of the 1998 Dun and Bradstreet industry listing. The sample was also stratified by state location, and all states are represented. Because internet providers are an important new part of the industry, but not systematically captured by SIC code, additional ISPs were identified through the Directory of National Dial-up Providers and Area Codes of Operation.

The telephone survey was administered in the fall, 1998 by the Computer-Assisted Survey Team (CAST), a Cornell-based survey research institute. The telephone interview averaged 50 minutes, and yielded a 54% response rate with 636 usable surveys. Respondents were asked to answer questions as they pertain to the "core" workforce in their establishment — the largest group of employees who carry out the primary work activity at that location. Using this information, we divided the survey into two groups: customer service and sales operations and network operations. The office operations include operator services, customer services, collections, sales, and marketing in 354 establishments. Of the 223 network surveys, 44 percent are from central office operations and 56 percent are from field operations.

To identify customer segmentation strategies, respondents were asked whether they targeted a particular customer segment or not. Establishments were then categorized into five groups: operator services, residential target, small business target, middle market target, or universal centers (those serving multiple segments). The middle market primarily includes regional businesses because national and global account executives frequently work on their own, or are based in small offices inside larger office complexes that were not accessible through the Dun and Bradstreet listing.

Appendix B

Table 1: The Customer-Provider Interface

The Organization of Service Work*

Dimensions of Work	Residential Call Centers			Small Business Centers		
	All	Union	Non-union	All	Union	Non-union
Customer-Employee Interaction						
Customers per employee per day	99.7	74.3	107.5	64.1	38.4	68.6
% interactions that are face-to-face	19.1	7.5	22.3	31.0	24.5	31.7
% phone-mediated interactions	80.9	92.5	77.7	69.0	75.5	68.3
Ave. minutes per customer call	6.0	6.5	5.8	7.0	11.2	6.5
Ave. call waiting time (in seconds)	100.9	128.0	93.2	112.7	23.6	123.4
% use of scripts: "some to a great deal"	8.7	17.4	6.2	10.4	0.0	12.0
Technology-Mediated Interaction						
% completed transactions on-line	73.6	80.7	71.5	63.4	56.4	65.3
% time on computer & phone	76.5	80.1	75.4	62.1	64.5	62.6
% time electronically monitored	48.7	65.7	44.2	34.2	42.0	33.6
Discretion** in Handling Customers						
Types of customers served	5.8	0.0	7.4	14.0	9.1	14.9
Handling additional requests	65.4	69.6	64.2	64.7	60.0	64.9
Settling customer complaints	78.9	87.0	76.5	53.6	60.0	52.1
How many customers to serve	18.2	9.5	20.5	23.9	22.2	24.2
Organization Characteristics						
Ave. customer base (1,000s)	819	2055	547	158	636	124
Ave. size of core workforce	188.9	338.1	147.6	74.7	244.0	49.6
# of customers per core employee (1,000s)	12.0	13.0	11.0	4.0	7.0	4.0
% market share	61.3	94.4	52.1	48.4	84.9	42.3
% whose market is international	3.8	0.0	4.9	5.8	0.0	6.8
% change in sales in 1998	27.6	19.1	29.4	36.1	7.7	39.6
Ave. span of control of supervisors	14.5	16.2	14.0	13.7	14.3	13.6
Employee Characteristics						
% of workforce that is female	72.2	82.7	69.5	59.5	73.5	58.2
% of centers that are unionized	21.9	100.0	0.0	12.8	100.0	0.0
% of centers that define core as exempt	12.9	19.0	11.4	26.2	0.0	30.6
Sample Size						
	105	23	82	85	11	74

* The data refer to average responses of establishments (not weighted by the number of employees per establishment)

** Average percent of employees having "a lot" or "complete" discretion over these decisions

Table 2: Skills, Discretion, and Team Participation

The Organization of Service Work*

Dimensions of Work	Residential Service			Small Business Service		
	All	Union	Non-union	All	Union	Non-union
Skill Level						
Ave. years of education of core	13.0	12.7	13.1	13.7	12.8	13.9
Ave. no. software packages used by core	3.6	4.9	3.3	3.9	5.4	3.7
No. email updates per employee per day	10.1	11.0	9.9	7.1	5.4	7.2
Discretion** Over Work Methods						
Daily tasks & assignments	34.3	39.1	32.9	46.5	54.6	46.0
Tools & procedures	23.8	21.7	24.4	30.2	0.0	33.8
Pace & speed at work	23.8	13.0	26.8	43.0	27.3	44.6
Setting work objectives	14.3	8.7	15.9	15.1	0.0	17.6
Revising work methods	23.8	26.1	23.2	22.1	9.1	24.3
Setting lunch & rest breaks	21.0	4.4	25.6	46.5	27.3	50.0
Setting vacation schedules	47.6	21.7	54.9	62.8	36.4	66.2
Design & use of technology	4.8	0.0	6.1	7.0	0.0	8.1
Participation in Teams						
% who use "offline" problem-solving	94.2	100.0	92.6	87.2	90.9	86.5
Of those who use offline teams: % of core	48.2	37.6	51.5	55.1	41.0	56.5
Ave. % use of offline teams	45.4	37.6	47.7	48.0	37.3	48.9
% who use self-managed teams	30.5	26.1	31.7	23.8	30.0	21.9
Of those who use self-managed teams: % of core	51.4	32.5	55.8	57.5	40.7	58.0
Ave. % use of self-managed teams	15.7	8.5	17.7	12.0	12.2	11.9
Sample Size						
	105	23	82	85	11	74
* The data refer to average responses of establishments (not weighted by the number of employees per establishment)						
** Average percent of employees having "a lot" or "complete" discretion over these decisions						

Table 3: Compensation, Training, Promotion and Employment Security

The Organization of Service Work*

Dimensions of Work	Residential Service			Small Business Service		
	All	Union	Non-union	All	Union	Non-union
Compensation						
Median annual base pay	27,271	30,198	26,386	34,786	37,700	34,393
Median annual overtime pay	1,764	2,912	1,462	1,674	4,029	1,419
Median base pay + overtime	29,072	33,362	27,908	36,494	44,457	35,578
90/10 ratio of pay (within establishment)	1.6	1.5	1.7	1.9	1.8	1.9
% pay that is variable	13.7	7.3	15.5	26.8	17.1	28.6
Benefits as a % of median pay	24.5	32.0	23.0	26.0	34.7	25.0
Median total compensation	35,503	43,196	34,038	44,815	58,757	43,237
Training						
Weeks of initial training	4.7	7.8	3.9	3.9	9.4	3.1
Weeks to become qualified	17.0	27.8	14.0	22.1	58.1	17.1
Weeks of on-going training/year	2.0	2.8	1.9	1.8	1.6	1.9
Promotion						
% promoted from within	37.6	40.4	36.8	33.7	50.0	31.0
% with < 1 year of tenure	31.2	21.8	33.8	31.4	17.7	33.8
% with < 10 years of tenure	67.4	50.0	72.3	77.1	47.5	81.1
% with > 10 years of tenure	32.6	50.0	27.7	22.9	52.5	18.9
Employment Security						
% who say mgmt has broken trust	15.0	19.6	13.7	8.4	14.0	7.6
% who use part-time employees	59.6	45.5	63.4	42.4	18.2	45.9
Ave. % use of part timers	9.8	8.3	10.1	9.3	0.5	10.7
% who use temporary workers	22.1	18.2	23.2	14.1	27.3	12.2
Of those who use temps: % of core	23.6	6.4	27.2	20.7	21.0	20.6
Ave. % use of temp workers	5.4	1.2	6.5	3.1	5.7	2.7
% workforce: perm.fulltime	86.1	90.5	84.9	87.8	93.8	86.8
% who outsource core work	25.0	30.4	23.5	20.0	18.2	20.3
Of those who outsource: % of work outsourced	18.7	11.8	21.0	15.9	5.0	16.6
Ave. % of work outsourced	4.4	3.2	4.7	2.9	0.5	3.2
% who insource work	5.8	8.7	4.9	14.1	18.2	13.5
Of those who insource: % of core work	35.8	2.5	52.5	24.1	2.0	28.5
Ave % of work that is insourced	2.1	0.2	2.6	3.4	0.4	3.9
Layoffs in 5 yrs, as % of current workforce	26.2	5.8	33.9	11.0	0.8	12.6
No. hired in last 2 years	299.9	690.2	190.7	94.2	89.3	94.7
Annual quit rate	15.7	8.5	17.7	14.1	4.7	15.6
Sample Size	105	23	82	85	11	74

* The data refer to average responses of establishments (not weighted by the number of employees per establishment)

Table 4: Earnings & Work Practices of Office & Field Technicians

Office & Field Technicians

Earnings & Work Practices	Employment Weighted Means		
	All Technicians	Office Technicians	Field Technicians
PAY			
Average Annual Pay	\$40,538	\$42,193	\$40,135
Average Annual Total Pay	\$49,513	\$51,021	\$49,513
HOURS, EDUCATION, EXPERIENCE			
Weekly Hours of Work	47.3	46.4	48.0
Education Level	13.1	13.6	12.9
Percent College Graduates	6.0	19.0	1.0
Percent with Less than 1 Year Experience	14.0	14.0	15.0
Percent with Less than 10 Years Experience	43.0	46.0	42.0
Percent Female	12.0	26.0	8.0
UNIONIZATION, MANAGEMENT			
Percent Union	76.0	59.0	83.0
Percent Exempt	7.0	12.0	5.0
Percent Managers in Establishment	18.0	22.0	17.0
DISCRETION			
Percent in Employee Involvement Programs	21.0	32.0	17.0
Percent in Self Directed Teams	8.0	11.0	8.0
Percent Home Garaging of Vehicle	15.0	5.0	18.0
Percent Electronically Monitored at Work	24.0	31.0	22.0
NETWORKS, MARKET			
Percent of Network Digital	35.0	53.0	31.0
Percent Employed in Wireless	3.0	4.0	3.0
Percent Employed in Long Distance	6.0	6.0	4.0
Percent Employed in Cable TV	5.0	1.0	6.0
Percent Employed in Local Exchange	74.0	57.0	83.0
Percent Employed in Customer Premise	2.0	2.0	2.0
Percent Employed in Internet Service	7.0	26.0	1.0
Percent Employed in Other Comm Services	2.0	4.0	1.0
Percent of Market Share	79.0	63.0	85.0
HR STRATEGY, TENURE			
Percent Receiving Promotions	54.0	68.0	48.0
Percent of Employees Part Timers	1.0	14.2	0.0
Annual Quit Rate	5.0	7.0	4.0
Percent of Employees Retired in last 5 years	19.9	8.4	24.8
Percent of Employees Laidoff the last 5 years	3.0	1.0	4.0
Percent of Employees Hired in last 5 years	35.3	52.2	29.5
Percent of Pay Variable	4.0	88.0	2.0
Percent of Employees Trusting Employer	79.0	88.0	76.0
Percent of Employees Temporary	1.0	2.0	1.0
Employer Changed Ownership	32.0	73.0	18.0
Year Establishment Opened	1987	1990	1986
Percent HR Department at Establishment	60.0	93.0	47.0
Number of Reorganizations in last 5 years	4.3	4.0	4.3
Branches Percent	98.0	95.0	99.0
Initial Training Hours	55.6	41.4	61.1
SAMPLE			
Percent of Sample		26.0	74.0
Employee Observations	25852	6731	19121

Table 5: Earnings & Work Practices, Union & Nonunion Technicians

Union & Nonunion Technicians

Earnings & Work Practices	Employment Weighted Means		
	All Technicians	Union Technicians	Nonunion Technicians
PAY			
Average Annual Pay	\$40,538	\$41,357	\$38,561
Average Annual Total Pay	\$49,513	\$51,021	\$46,166
HOURS, EDUCATION, EXPERIENCE			
Weekly Hours of Work	47.3	47.6	46.5
Education Level	13.1	12.8	14.0
Percent College Graduates	6.0	0.0	23.0
Percent with Less than 1 Year Experience	14.0	13.0	19.0
Percent with Less than 10 Years Experience	43.0	32.0	74.0
Percent Female	12.0	12.0	13.0
DISCRETION			
Percent in Employee Involvement Programs	21.0	15.0	42.0
Percent in Self Directed Teams	8.0	5.0	18.0
Percent Home Garaging of Vehicle	15.0	12.0	25.0
Percent Electronically Monitored at Work	24.0	23.0	27.0
Percent of Techs Working in Offices	26.0	20.0	45.0
Percent of Network Digital	35.0	34.0	43.0
NETWORKS, MARKET			
Percent Employed in Wireless	3.0	0.0	9.0
Percent Employed in Long Distance	6.0	1.0	22.0
Percent Employed in Cable TV	5.0	1.0	20.0
Percent Employed in Local Exchange	74.0	95.0	10.0
Percent Employed in Customer Premise	2.0	2.0	2.0
Percent Employed in Internet Service	7.0	1.0	28.0
Percent Employed in Other Comm Services	2.0	0.0	8.0
Percent of Market Share	79.0	93.0	35.0
HR STRATEGY, TENURE			
Percent Receiving Promotions	54.0	56.0	46.0
Percent of Employees Part Timers	1.0	0.0	2.0
Annual Quit Rate	5.0	3.0	11.0
Percent Retired in Last 5 years	19.9	25.2	5.7
Percent Laid off the Last 5 years	3.0	2.6	3.8
Percent Hired in last 5 years	35.3	25.0	68.3
Percent of Pay Variable	4.0	2.0	11.0
Percent of Employees Trusting Employer	79.0	76.0	91.0
Percent of Employees Temporary	3.0	2.0	7.0
Employer Changed Ownership	32.0	29.0	44.0
Year Establishment Opened	1987	1989	1986
Percent HR Department at Establishment	60.0	55.0	78.0
Number of Reorganizations in Last 5 years	4.3	4.1	4.8
Branches Percent	98.0	100.0	93.0
Initial Training Hours	55.6	60.0	40.5
Percent Management in Establishment	18.0	22.0	17.0
SAMPLE			
Unionization Rate		76.0	
Employee Observations		20106	6333