Final Report

Workplace Transformation and Human Resource Management Practices

in the Pulp and Paper Industry

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[1] There were three other significant research team members that I would like to acknowledge. Professor Steven Vallas, now of George Mason University, Professor Nathan Bennett of Georgia Institute of Technology, and Raul Necochea, now of McGill University

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Introduction

During the past several decades, we have seen organizations in many industries transform work processes and the role of the production worker through the introduction of high performance work systems (HPWS). High Performance Work Systems include the design of work and the supporting human resource practices such that there is a maximal fit between the company's technical system and its social system. The HPWS experience in the paper industry has been varied and there are many questions about the appropriate approach to these innovations. This report presents a research literature review for understanding the adoption, implementation, and management of these innovations. The research literature covered is that contained in the publicly available academic research domain with an emphasis on research published in the last 10 years. It does not include studies conducted by companies or industry trade groups that were not published in generally acceptable research journals. This report will discuss various organizational, managerial, and workforce issues that are relevant to the decisions to implement workplace innovations.

High Performance Work Practices and Organizational Outcomes

The decade of the 1990's and early part of the 21st century have witnessed a plethora of research interest in the relationship between various human resource management practices, transformed work, and worker involvement and organizational effectiveness. Cappelli and Neumark (2001) trace the history of the high performance work practices concept and employer used in the United States and identify the success of Japanese imports during the 1970's and 1980's as an important factor. Though academic authors had alluded to various progressive management practices under the guise of Human Relations of the 1930's-1950's and the Job

Enrichment and Redesign research of the 1960's and 1970's, there were few employers who were adopting such practices. Through the success of Japanese manufacturers in consumer electronics and automobiles, U.S. employers were forced to examine the sources of such competitive advantage.

Early claims of superior Japanese work practices which included Quality Circles and Total Quality Management were often times dismissed as being not relevant for U.S. based manufacturers because of the belief that the success of such practices were dependent on cultural factors present in Japan, but not the U.S. This belief was shattered by the success of the joint venture between Toyota and General Motors (GM) in establishing the New United Motor Manufacturing, Inc. (NUMMI). This new company took over the operation of the Fremont, California automobile manufacturing plant of GM. This plant had had a poor record of productivity, quality, and industrial relations between GM management and the local United Autoworkers Union. However, under the NUMMI agreement, Japanese managers would manage the plant and use UAW members as employees once a new, more flexible, collective bargaining agreement was reached. The success of NUMMI has been well documented and appears as a case in the research by Womack, Jones, and Roos (1990) which was published in the book titled, "The Machine that Changed the World".

The 1990's saw a rapid increase in the adoption of high performance work practices as well as research on their effectiveness. In looking at enterprise level data on large for-profit organizations, Lawler, Mohrman, and Benson (2001) found that in 1987, only 28% of firms reported having *any* employees covered by self-managing work teams, while in 1999, 72% of firms reported having at least some employees covered by such teams. However, the trends on increasing presence of such practices is a bit more complex in that some practices, such as

quality circles, showed increasing rates through the middle part of the 1990's but then had decreased by 1999. Osterman's (1994, 2000) survey results (National Survey of Establishments) compared 1992 rates with 1997 rates and tended to show the same pattern as Lawler et al.

The impact of these HR innovations has been studied in a number of ways. First, there has been research at different levels of analysis ranging from firm-level studies such as those by Huselid (1995) and Huselid and Becker (1996) to specific operations within production facilities such as those of Arthur (1994) and Ichniowski, Shaw, and Prennushi (1997). In addition to different levels of analysis, there have also been studies which focused on specific industries (again the studies by Inchnowski, et al. and Arthur in the steel industry and by Applebaum, Bailey, and Berg (2000) looking at apparel, steel, and medical instruments/imaging industries) while others have cut across industries (such as those that use the National Employers Survey, NES, which is conducted by the U.S. Census Bureau and uses a sample that is representative of all private establishments with 20 or more employees).

In addition to the organizational levels and industry specificity differences, there are also differences in which management practices are considered as part of a set of High Performance Work Practices. In an early review of the research, Becker and Gerhart (1996) noted very little commonality in practices considered and this can still be seen as a shortcoming in the accumulating research to date. Finally, there have been differences in the consideration of contingency factors; or factors that would influence the impact of high performance workplace practices on organizational outcomes. The research on HPWS and organizational outcomes will be described next.

Benchmarking the Progress

Research on high performance work systems has progressed under a variety of labels including workplace innovation, transformational work practices, high commitment work systems, high involvement systems, and so on. The common theme throughout the studies is that management practices related to an organization's human resources have important effects on organizational performance and worker outcomes. The research has proceeded using a variety of methods (e.g. single organization case study, comparative case study, cross-sectional survey, longitudinal survey)

Three major reviews were published in mid-1990's. First, Kling (1995) reviewed the extant research on high performance work practices and concluded that most of them had been associated with higher performing businesses, that 'systems' of practices had a greater impact than individually adopted practices, and that the question of causal direction between performance and HPWS needed stronger research designs.

Second, Ichniowski, Kochan, Levine, Olson, and Strauss's (1996) review reached three major conclusions. First, they concluded that research shows that HR practices can improve productivity by the use of practices that enhance worker participation, create more flexible job designs, and decentralize decision-making. Second, when implemented as systems of related practices, these innovations have large, economically important effects. Finally, they concluded that a majority of U.S. businesses had adopted some form of innovative work practice, but only a small percentage had adopted a full system.

The authors gave several reasons why the adoption of a broader array of practices was not more widespread. First, changing practices of existing organizations is more difficult than

instituting new practices in new facilities. Second, the sheer number of practices that comprise a

"system" may be daunting and thus firms adopt one practice at a time with disappointing results

which discourages further innovation. Third, the HR practices may need to be coupled with

other capital intensive organizational changes such as new production technology which makes

the decision less likely because of cost. Fourth, there may be labor-management distrust

surrounding management and union intentions. Fifth, as in most organizational changes, some

individuals will benefit while others may perceive losses (such as those with high levels of

seniority) leading to resistance. Sixth, institutional factors such as the financial markets that

favor low cost labor practices and government policy concerning union protection may also

create financial barriers.

Ichniowski et al. (1996) cited the need for research in several areas. First, in noting that

most HPWS studies had been conducted in manufacturing, they recommended more service

sector research. Second, they suggested that more research was needed on how worker outcomes

(such as job satisfaction and pay structures) are affected. Finally, they recommended the study

of HPWS under different environmental conditions such as growing vs. declining product

markets, union support vs. no support, etc.

In the final major review of the mid 1990's, in 1996, a special issue of the *Academy of*

Management Journal was published which, in total, also documented the relationship between

HR practices and organizational performance, but had a greater emphasis on how different

organizational strategies might be better suited by different HR practices.

A subsequent review by Delery and Shaw (2001) summarized both theoretical

developments and new research. Using the *Strategic Human Resource Management* label, these

authors were posing somewhat different questions than the Ichniowski et al (1996) paper had

done. They found that empirical research tended to internationalize the application of earlier

findings on HPWS.   For example, work by Ichniowski and Shaw (1999) showed that Japanese

and American Steel production lines were equally productive when HPWS was used and Lee

and Miller (1999) found that in a sample of Korean firms, employee commitment was important

for financial performance, especially when the firms had a strong commitment to a particular

competitive strategy. In continuing this trend, Den Hartog and Verburg (2004) conducted a

cross-industry multi-source survey of firms in the Netherlands. They found that support for the

association of HR practices with organizational outcomes such as economic outcomes and

perceptions that the workforce would exert effort beyond the formal contract. Their strongest

effect was for a composite of HR practices that tended to influence employee skill and direction

(e.g. use of selection tests and assessment centers, training, management development).

Countering this trend of supportive findings for HPWS were a series of recently

published studies. Cappelli and Neumark (2001) used data from the 1994 and 1997 NES surveys

and the Census Bureau's Longitudinal Research Database (LRD) in order to create panel data on

manufacturing establishments that included extent and coverage of HR practices.   The outcomes

variables of interest in this study were sales per worker, total labor costs per worker, and the ratio

of these two variables. The authors argue that high performance work practices may both

increase productivity and labor costs. The value to the organization of HPWS must take both

into account in determining economic payoff.

From their analysis of the data, Cappelli and Neumark (2001) conclude that there are few

statistically reliable results for HPWS for either productivity or cost-adjusted economic gain.

This conclusion holds for both the individual practices and "bundles" which are examined as

statistical interactions. On the other hand, there are stronger relationships between certain

HPWS practices (TQM, team training, and profit-sharing) and labor costs. In examining the effects on a statistical index that incorporates both sales per worker and cost per worker, the authors conclude that by and large the two effects are off-setting in that the higher average labor cost is associated with higher productivity. The actual gain (or loss) varies as a function of which specific practice is considered. For example, TQM is estimated to increase labor costs by 10.4%, while increasing productivity by 5.2%, while profit-sharing increases labor costs by 7.4% while boosting productivity by 12.2%.

There are several limitations to the Cappelli and Neumark study. They looked only at establishments that existed in 1977. Thus new manufacturing facilities were not considered. In one sense, limiting the study to "brownfield" sites eliminates one important confound in broader populations. However, the linkage between HPWS, technology enhancements and high performance might be most evidenced in "Greenfield" sites. This study provides an important set of findings that are counter to the prevailing research findings. It suggests that greater attention may need to be paid to cross-industry factors that influence productivity enhancements from HPWS.

Freeman and Kleiner (2000) constructed panel data using a cross-industry survey of employee involvement (EI) programs and production and financial data from COMPUSTAT. Notice that this study focused exclusively on worker participation and did not include any supporting or complementary HR practices such as training, pay-for-performance, employment security policies, etc. They found that, in isolation, the EI practices had little effect on productivity and financial outcomes.

Staw and Epstein (2000) used informational reports from popular press outlets such as newspapers on various work system innovations such as empowerment and teams. They then linked various indices of citations to a company concerning a particular practice with financial performance as well as company reputation. They found no relationship for the documented presence of workplace innovations (as measured through the citation indices) with financial performance. However, they did find effects of the workplace innovations on subsequent company reputation as well as executive compensation. The authors argue that work system innovations are faddish in nature and adopted for reasons other than economic performance. The methodology of this study, though refreshingly different than traditional survey measures, is even more removed from the actual practices and thus subject to additional sources of measure contamination.

One of the shortcomings of much of the research described or referenced above was that it was conducted at such an abstract level that it is difficult to visualize exactly how an organization goes from some standing on an abstract measure of HPWS to organizational performance as indexed by some generalized financial indicator such as return on assets. Although this general association may be statistically present more times than it is not, industry audiences may still be suspicious. The next major category of research studies are the industry studies in which research concentrates on firms and operating units within a particular industry; often time focusing on a specific function such as steel rolling or semiconductor wafer fabrication.

Industry Studies

Arthur (1994) looked at productivity, scrap rate, and turnover rate differences between steel mini-mills with labor relations systems he classified as "control" or cost minimizing or

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"commitment." The mills with commitment systems had higher levels of reported employee participation on problem solving groups, decentralization, investment in training, due process, wages, and benefits than did those that had "control" systems. Mills with commitment systems had higher levels of productivity and lower scrap rate and lower turnover than did mills with control systems. In addition, the impact of turnover on productivity and scrap rate was much higher for commitment mills, thus demonstrating the destructive impact of losing human resources in this system.

Ichniowski, et al. (1997) studied HPWS in steel finishing lines and found that those lines that included incentive pay, teams, flexible job assignments, employment security, and training achieved higher levels of productivity than those that used more traditional practices such as narrow job descriptions, hourly pay, and so on. This is a frequently cited study because of its extensive on-site data collection and fine-tuned productivity model.

Applebaum, Bailey, and Berg (2000) conducted an ambitious study of 3 industries; steel, apparel, and medical electronic instruments and imaging. Their research design included site visits to the manufacturing facilities, collection of plant performance data, interviews with managers and union officials (where appropriate) and surveys of workers at each plant. They obtained data from sufficient samples in each industry that allowed them to analyze the relationship of high performance work practices and productivity and quality. HPWS was assessed by a composite of responses to questions concerning work design, compensation, employment security and training. Their findings supported the positive impact of HPWS within each of these three industries.

Appleyard and Brown (2001) studied employment practices and manufacturing productivity in the semi-conductor industry. They used data from the University of California-

Berkely's Competitive Semiconductor Manufacturing program. In this study, data were gathered from 23 fabrication facilities in the United States, Europe, and Asia. Semiconductor manufacturing is a technology intensive process. As the product becomes more complex, so must the manufacturing process. Thus, 8 inch wafers require more computerized automation than do 6 inch wafers. The authors argue that the increasing level of technical sophistication has limited the potential impact of HPWS for the equipment operators. For example, in the 8 inch fabs, much of the Statistical Process Control functioning is self-contained in the computer controllers. Operators are not collecting and analyzing data, but rather monitoring equipment to make sure everything is functioning.

Because equipment operation is driven by computer software, the role of software engineers has increased in the more highly automated 8 inch fabs. Therefore, the authors argue that the employment practices associated with the engineers will be more relevant to productivity improvements than those associated with operators. Interestingly, all levels of employees (engineers, technicians, and operators) received at least 11 weeks of training per year in their first 3 years of employment, on average. The amount of training received by technicians was the only training variable associated with higher productivity. In the 6 inch fabs, the level of involvement of the engineers in SPC activities was positively related to productivity. Because of the small sample sizes available (only 23 total) and the authors' use of the 6 inch and 8 inch fabs as sub-samples, the statistical results should be treated with caution.

This study is important because it looks at multiple levels of employees in manufacturing settings where there is a high level of technological sophistication in both product and process. The skill/de-skilling of operator jobs is an interesting sidelight here in that the operators typically had high school degrees, but no higher, and in the 8 inch wafers fabs, the information processing

aspects of process control had been more fully computerized thus reducing their positive contribution. And yet, there was still extensive training.

Bartel (2004) studied the human resource management environment in branch banks of a single major bank in Canada. The focus on HR environment is really an acknowledgement of the informal managerial impact because these environments varied considerably across branches even though there was a standard set of HR policies throughout the branches. The human resource environment data came from annual employee surveys conducted by the bank and performance was indicated by growth rate in both loans and deposits. Study controls included both market characteristics such as total population and income-related demographics and branch characteristics such as age, average tenure of employees, and number of full time employees. More effects of HR practices were shown on loan growth rate. Important perception variables were "understanding performance evaluation system", "express views at meeting", "upward communication", "overall communication", and "frequency of feedback." Overall, the author summarizes the relationship: for one standard deviation improvement in the HR environment there was a16 to 26% improvement in deposit and loan annual growth rates.

Perspectives on the Impact of HR Practices

Thus far, the presentation concerning the impact of HWPS on organizational outcomes has assumed that these practices will be effective for any organization. This approach has been called "Best practices" or "Universalistic". Alternative perspectives include contingency and configurational. Contingency theorists argue that HR practices must fit with other features of the organization and its strategy. Thus, the appropriate mix of practices (e.g. those that support a larger, more discretionary role for lower level workers) might depend on the competitive strategy

of the organization. Configurational theorists argue that the impact of any particular HR practice might be negligible, unless it fits with other complementary practices. These theorists look for "bundles" of HR practices that make a difference. These two alternative approaches will be considered next.

Contingency Approach. Since the mid 1990's there has been more attention paid to explaining the conditions under which HPWS could influence the financial success of an enterprise. Organizational strategy was one such condition. One explanation was that human resources were an advantage in a competitive market when these resources were difficult to copy by a competitor (Barney, 1991). The unique qualities of the resulting workforce would provide a sustainable advantage because competitors could know of their existence, but be unable to buy them or copy them. This resource-based view of HR led some authors to propose that the strategic importance of HPWS might be limited to a core set of employees as opposed to all employees in an organization (Lepak and Snell, 1999) because not all employee groups work equally on value-adding tasks.

Another theme within this strategic perspective is that some HR practices might be more effective for implementing certain organizational strategies. In support of this idea, Batt's (2000) study of 354 call centers showed that those call centers servicing higher value customer markets required employees to have higher skills, provided more discretion to employees, had greater numbers participating in teams, and paid them more.

Another category of contingency factors concerns the nature of the work the organization is performing. One of the fundamental assumptions underlying High Performance Work Systems is that information should be widely shared among employees. The nature of the information can include everything from production outcome information to organizational

performance information (such as Open Book Management). The dissemination of information is assumed to promote better problem solving as well as trust. What is often overlooked in discussions of HWPS is the more nuanced aspects of information generation, interpretation, and transmission. Specialists often make decisions that require advanced education and training to interpret both quantifiable and qualitative information. They also depend on other individuals for much of this information. This creates opportunities for errors of commission (providing an incorrect representation of some entity or action) and omission (failing to pass along some important information). When the communication process distorts what information the specialist receives relative to the reality of the entity or action, the specialist will make incorrect decisions.

Though this distortion phenomena can occur in any work environment, Preuss (2003) argues that it is especially problematic in work situations with equivocal information or that which can be interpreted in multiple and possibly conflicting ways. He examined the role of information quality in the incidence of incorrect patient medication in 50 acute care hospital units. The work system factors examined here included 1) breadth of job tasks for Registered Nurses (seen as high skilled) and nursing assistants (seen as low-skilled), 2) the level of employee knowledge (both formal education and on-the-job experience), 3) employee involvement (through participation in setting work schedules, developing care procedures, providing training for others, and defining jobs in the unit, and 4) continuous improvement activity in the form of formal *care pathways* which standardize care for patients following specific procedures and provide a means for evaluating the effectiveness of care delivery. Results supported the importance of employee knowledge and job breadth for the RN's, and information quality in explaining variation in medication errors. The effects for employee

involvement, continuous improvement, and job breadth for unskilled workers were not significant. Preuss (2003) argues that hospitals have undertaken work system rationalization in order to save labor costs. This means that lower paid nursing assistants engage in many primary care activities such as bathing a patient. This eliminates an opportunity for the higher skilled RN to interact with the patient, observe physical appearance, mental state, etc. The knowledge base of the RN would allow them to better interpret this equivocal information than could a nursing assistant.

Another work-related contingency factor is that of technology. Perhaps certain operating technologies benefit more than others from the HPWS. The influx of computer technology into many aspects of work has been profound. However, the historical view of technology differences was rooted in manufacturing and only, more recently has it been applied to service operations. Batt (1999) examined how different information technology systems and different work organization affected the performance of customer service representatives in a large call center. Performance in these jobs required both efficiency (working fast), but also selling services. The technology differences were in the level of automation. Under the traditional system, workers picked up the phone whereas in the new system, calls were automatically routed to the next available representative which allowed more centrally controlled pacing of the work which was experienced as more stressful by the workers. Management and union negotiated a TQM program and a self-managed team program. Management hoped to cut staff and the union hoped to save jobs. As part of the study, there were workers in TQM, self-managed teams, or neither. In addition, workers were working under the old technology or the new technology. The research found that the self-managed team approach had a significant impact on sales volume. The impact of new technology was not significant except when paired with a self-

managing team structure. The aspect of this structure that seemed particularly important was the ability of the group members to interact with each other and regulate their own activity. A parallel qualitative study of the same organization yielded comments that workers in the self-managed teams attributed their success to the fact that management was off their backs, they could set group goals rather than individual goals, they could help each other with sales strategies, handling problem customers, etc.

Configurational. Proponents of HPWS often emphasize the importance of implementing systems or bundles of complementary HR practices. In trying to demonstrate this effect analytically, Milgrom and Roberts (1995) used optimization models to better describe complementarity in manufacturing organizations and applied their theory to Lincoln Electric Company where they suggest that competitive advantage from HR practices is derived from complementary procedures which are difficult to copy in total. For example, Lincoln has not only extensive piecework and bonus pay systems, but also tolerates high levels of Work in Process in order to provide opportunities to work. Such short term process inefficiencies are tolerated because 80 % of the company's stock is owned by employees and managers who believe in the Lincoln approach.

The configurational approach has been evident in many of the studies cited through this report. Many researchers consider their research as supporting a configurational approach when some index of HR practices accounts for more variance than the individual practices themselves (e.g. Ichniowski et al., 1997). Macduffie (1995) looked at the configurational impact across three organizational dimensions in automobile manufacturing plants; 1) use of inventory buffers, 2) work systems, 3) supporting Human Resource practices. He found that the interaction of these three dimensions was associated with organizational productivity, suggesting

complementarity. Shaw, Gupta, and Delery (2001) found that among concrete pipe manufacturers, Total Quality Management, as a work system, was complemented by the form of compensation system in its effect on both labor productivity and customer satisfaction. Interestingly, skill-based pay plans which encourage individuals to become multi-skilled were more important in this regard than team-based performance incentives.

Comparing the Perspectives

Delery and Doty (1996) studied the validity of the universalistic, contingency, and configurational perspectives in the banking industry. The strongest support was for the universalistic perspective, but there was some support for both the contingency (fit with strategy) and configurational (bundling) perspectives.

Delery (1998) has also critically analyzed the various approaches to aggregating practices within the HR domain and argues that current practices such as adding practices together or clustering organizations on practices lack theoretical coherence. He suggests alternatives that would provide better coherence such as discrepancies for an *a priori* pattern of practices.

Mediating Mechanisms

There has also been a continued interest in explaining the mechanisms through which HPWS influences the productivity and financial success of an enterprise. In the field of organizational behavior, these are called mediating variables. HPWS affects the motivation, skills, and discretionary opportunities for the individual. One approach to the mediation is to focus on skill enhancement that results from HPWS or how does HPWS affect what a worker can do that would ultimately impact an organizational outcome.   Although this *human* capital tends to characterize the value gain due to increases in worker knowledge through education,

training, and experience, *social capital* represents the value gain due to the web of social contacts that individuals build which allows them to quickly access others for a variety of information and support needs (such as problem-solving, advocacy, back-up, etc.). Uhl-Bien, Graen, and Scandura (2000) take the position that *social capital* represents a web of social contacts that accrue to individuals as they interact with others in organizations. These social contacts evolve from role-making processes, partially associated with leadership processes such as leader-member exchange. Social capital then becomes a source of competitive advantage because it is difficult to copy. This social capital goes beyond traditional economic views of *human capital* which represents an individual's work-relevant education and experience. Evans and Davis (2004) have recently extended the framework concerning HR Practices and Social capital to include mediating variables such as opportunities for role-making and psychological empowerment. One primary function of this social web is communication; the ability to send and receive efficiently using both formal and informal channels.

Breaking down the social factors further, Podsakoff, Ahearne, & MacKenzie (1997) studied 40 paper machine work crews in a single paper mill producing bond and catalog paper, looking at Organizational Citizenship Behaviors and crew performance in terms of quality and quantity. The crews worked under a group gain-sharing pay plan that typically resulted in 5-8% of the crew's pay. The citizenship behaviors included helping, encouraging, and task-related communication. The behaviors, especially helping behavior, were positively related to both quantity and quality of paper produced.

In exploring the relationship between work system design, HR practices, and communication networks, Gant, Ichniowski, and Shaw (2002) studied communication networks in steel finishing mills. Four of the mills operated under "control-oriented", CO, human

resource systems which were run with little employee involvement and more managerial control. Three of the mills had "involvement-oriented", IO, human resource systems that had greater employee involvement. The communication networks in the IO mills are much more extensive with more workers communicating vertically and laterally. This communication is a natural outcome of job changes and assumed problem-solving responsibilities. In the CO mills, the communication networks are not as dense for all workers. Rather, there may be a few workers in each crew that act as a central node for communication. Some of the CO mills were attempting to adopt more worker involvement, yet the rank and file saw little reason to participate in off-line problem solving teams because they felt that didn't get paid for it, couldn't find back-ups, felt the teams were not run well, and felt their opinions didn't matter to management.

Bowen and Ostroff (2004) suggest that HR practices influence organizational outcomes through *organizational climate*. The *climate* concept focuses on the shared perception and interpretation of organizational practices, policies, etc. Climate reflects perceptions of situations and the appropriate and valued behaviors. When employees interpret a situation similarly, we can speak of a strong climate. Systems of HRM practices that send consistent signals about organizational goals and valued employee behaviors increase the likelihood that goals and behaviors are realized.

Vandenberg, Richardson, and Eastman (1999) tested a causal model of high involvement work practices on both turnover rates and return on investment in 49 life insurance companies. The high involvement practices were those that influenced the power, information, rewards, and knowledge available to workers. High involvement employers had higher levels of morale which yielded both higher ROE and lower turnover. Morale consisted of job satisfaction, organizational commitment, and turnover intentions. This study provides stronger justification

for the causal ordering of practices affecting attitudes which, in part, affect organizational

performance.

Impact of HR Innovation on Workers

One of the early controversies concerning the impact of technology in the workplace was

whether or not it would lead to lower or higher skill requirements for production workers

(Braverman, 1974). The deskilling hypotheses assumed that technology would primarily

automate skilled work processes and leave workers with lower level jobs. The case for higher

skill requirements was based on an automation process that replaced routine, manual tasks of

workers, but required high level cognitive skills on the part of workers (Zuboff, 1988). More

recent views on skill changes in production jobs incorporate other organizational changes that

are occurring concurrently with technological changes, such as human resource practices and

transformed work. Burris (1998) notes that many scholars of these trends tend to assume a

certain unity among organizational restructuring, worker skill, and power and authority

relationships. However, in the many case and quantitative studies she reviewed, Burris finds

many different combinations. Thus, change often refers to changes to the design of production

jobs, the introduction of teams, quality improvement programs, de-layering of the organization,

and so on. Cappelli and Rogovsky (1994) demonstrate one implication of this in a study of skill

changes with data coming from 561 workers in jobs ranging from production to management.

The major changes appeared to be in interpersonal skills and this effect held for both managers

and workers.

Sewell (1998) has analyzed the surveillance and control aspects of team work in

organizations. He builds off Barker's (1993) idea of 'concertive' control in which peers act as a

more prevalent controlling force than do supervisors in team based organizations. Sewell suggests that although teams do present 'more eyes' that may watch and react (thus greater surveillance), this does not need to increase the level of *management* control. Teams that have the freedom to identify and enforce their own norms concerning member behavior may have retained substantial power and influence whereas teams that adopt formal organization procedures for rules concerning important performance related behavior, attendance, and so on may have more difficulty retaining power and influence independent of management.

Liker, Haddad, and Karlin (1999) concluded that much of the impact of technological change on work systems will depend on one's perspective. Rather than viewing technology as a deterministic force shaping work practices, authors suggest that the interested observer consider perspectives that vary in their time-boundedness and the degree to which their primary focus is on the technology or contextual factors. Vallas and Beck (1996) view the impact of technology *and* work system change on shop-floor jobs. In their view, based on observation and interviews in four pulp and paper mills, the combination of the analytical tools of Total Quality Management and the process controls associated with automation and computerization of continuous production processes for paper-making have resulted in work processes more conducive to the rhetoric of process engineers than paper-makers. In their eyes, this has resulted in occupational barriers for paper machine operators in terms of upward promotion. In a case study of skilled workers in the United Kingdom's aerospace industry, Danford, Richardson, Steward, Tailby, and Upchurch (2004) found a deterioration in quality of work-life and participation following the introduction of high performance work systems.

Gale, Wojan, and Olmsted (2002) also looked at organizational and technological change by examining data from a large scale survey of manufacturing establishments. Mail-out surveys

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and follow-up phone interviews yielded data on about 3900 establishments out of an initial

sample of about 5700. The survey included questions about both technologies (Computer-Aided

Design, Computer Numerically Controlled Machines, Programmable Controllers, Local Area

Network) and management practices (Self-directed work teams, Job rotation, Employee problem

solving groups, Statistical Process Control, and Total Quality Management). The skill

requirements were assessed by asking whether each of 6 skills had 1) increased a lot, 2)

increased a little, 3)stayed the same, or 4) decreased. The six skill areas were computer,

interpersonal/teamwork, problem solving, other technical, basic math, and basic reading.

Gale et al. (2002) found that both the number of technologies present and the number of

management practices present had positive relations to all six skill areas. In addition, the work

organization scale was particularly important to the increases in problem-solving and

interpersonal skills. The authors point out that in response to technological change, many

academic and vocational programs have emphasized improved math and technical skills.

However, critical areas of problem-solving and interpersonal skill may be overlooked and cutting

edge employers may still not find the appropriate skill mix.

When new technology is introduced into existing facilities, human resource practices

invariably must be examined. For example, will recruits be chosen based on aptitude or

seniority? How much preference should be given to the current workforce as opposed to the

external labor market? If programming becomes a required skill to operate manufacturing

equipment, should programming specialists be hired or can current blue collar employees be

trained as programmers? Kelley (1990) studied the issue of whether or not blue collar workers

acqired programming responsibilities in settings where programmable manufacturing was

implemented. She found that smaller plants were more likely to use blue collar workers than

larger plants. Regardless of how these decisions are resolved, for some time there will be the

"old" production area and the "new" production area. If the new area is staffed with the best

employees from the old area, then the old area may suffer from productivity and quality

problems that may offset gains in the new production area. One approach to solving this

problem is extensive training of workers from both old and new lines. Leppanen (2001)

describes a training program based on conceptual mastery of both work and production processes

as well as group functioning. The program depended on group learning through extensive

analysis of work processes. The program was applied to a Finnish paper mill that had introduced

a new paper machine. In this mill, the new paper machine had been staffed extensively with the

best workers from the old paper machine (the operating personnel were selected from over 1000

applicants). This hurt the operating efficiency of the old machine. After extensive conceptual

mastery training of workers from both the old and new paper machines, the quantity and quality

of the old line recovered. The author emphasizes that although mastery knowledge of work

processes is acknowledged as a necessary condition for organizational success, the use of the

group methods used in this study are not common in industrial settings.

In contrasting the Canadian newsprint industry to that in the United States, Holmes

(1997) examines work reorganization strategies and how U.S. paper makers had achieved greater

flexibility in worker assignment by the 1990's. Based on his findings, Holme's argues that

through both economic analysis and case study of newsprint mills, functional flexibility is more

important than numerical functionality in impacting cost and productivity through minimizing

machine downtime and malfunctions. Functional flexibility reflects the situation where the

workforce is multi-skilled and management has the ability to assign workers to different tasks,

depending on need. Numerical flexibility is an approach that emphasizes employing more

contingent workers whose total size will vary with the labor needs of the mill. The advantages of the functional flexibility approach comes from the operating requirements of computer controlled pulping and paper-making operation that depend more on intellective than physical skills. These intellective skills take time to require and less likely to be present in a contingent workforce.

<u>High Performance Work Systems, Worker Participation, and Job Influence</u>

HPWS invariably call for greater levels of worker involvement in decision making. The particular format of this involvement and its effectiveness is one of the key areas of interest in research on HPWS. For example, contrast the involvement of workers in self-directed work teams with that of workers in quality circles. In the former situation, employees can directly affect work processes (exert high influence), whereas in the latter, workers are more advisory. In an extensive study of worker participation formats and employee job influence, Delbridge and Whitfield (2001) reported on results from a national employer survey in Great Britain. Data were collected from 2191 establishments and over 28,000 employees. Employment practices that facilitated worker participation were assessed via interviews with a high level human resources person while worker perception data were gathered through a written survey. As individual practices, quality circles and representative participation (committees that represented employees and managers) showed less effect on perceived job influence than did briefing groups where a broader based of employees could raise issues and ask questions. In addition, organizations with more groups where the employees appoint the team leader were also more likely to have greater employee influence. Finally, and surprisingly, organizations with more

teams directly responsible for a product or service had less employee influence. This study is important because it focuses on a worker outcome (perceived job influence) that might be related to stress and satisfaction. It is an indirect indicator of worker control over pace, skill variety, and work methods which often affect the level of experienced stress..

Another worker outcome of growing importance is work/life balance. Attaining and maintaining balance is a challenge for many families because of the increase in dual-earner families and dependent care responsibilities, both children and elders. Employer responses to these needs has included more flexible work places and various forms of assistance, such as childcare and eldercare. An overview of research and theory on work/family human resource practices and firm performance is available in Arthur and Cook's (2003) recent review. Though it is easiest to point to formal company policies, such as flextime, or benefits, such as dependent care accounts as sources of work/life assistance, some authors (Berg, Kalleberg, and Applebaum, 2003) have suggested that High Performance Work Systems will facilitate the achievement of greater balance through their effect on workers' ability to better control and manage their non-work lives. They argue for a spillover effect from the self-confidence and greater control that is encouraged by HPWS to the employee's outside life. This is counter to Hochschild's (1997) claim that participatory work arrangements drain time and energy from home life responsibilities. In part, this is because the team and participatory environment of the workplace engender greater commitment on the part of employees and they willingly spend more time and energy at work (thus detracting from home life). In the field of industrial and organizational psychology, the spillover effect refers to affective reactions to work (such as job satisfaction) and has generally received more empirical support than the opposite, or compensatory effect where one domain detracts from the other (Summer and Knight, 2001).

Berg, et al.(2003) studied this effect in a multi-industry sample of manufacturing facilities (apparel, medical instruments & imaging, steel) by phone surveys of random samples of non-supervisory employees from each facility, This large sample (total N = 4374) is the same used for "Manufacturing Advantage: Why High Performance Work Systems Pay Off" (Applebaum, et al., 2000). In the current report, the authors find that several aspects of HPWS are statistically related to the reported extent that "your company helps workers to achieve a balance between work and family responsibilities". Specifically, informal training, opportunity to participate in decisions, pay for performance, and promotional opportunities were positively related to perceptions that employer was facilitating balance. It is difficult to interpret magnitude of effects. The effects do occur after statistical controls for family status, job demands (such as hour per week of work), and other aspects of social support at work such as an understanding supervisor.

Batt and Valcour (2003) studied work/life conflict a more limited sample of white collar workers in dual income families from seven organizations. In their research, they identified multiple management practices that might affect experienced work/family conflict. First, there are the formal practices such as dependent care assistance or work scheduling flexibility that an employer might offer. There is also the informal support that one's direct supervisor might offer by allowing them to switch schedules or at least listening to their problems. Next there are HR practices that could increase felt security such as high pay, perceived security, and career management services. Then there is design of work that allows autonomy and/or collaborative work environments. Finally, there is information technology that allows telecommuting and/or receiving and acting on work-related information at home. The authors also looked at the relationships between variables in these clusters and perceived control and turnover intentions.

Of the management practices frequently considered HPWS, employment security showed consistent negative relationships with work/life conflict, and frequency of interpersonal coordination with other employees was negatively related. Autonomy was not related to work/family conflict. Interestingly, higher pay was positively related to work/family conflict. These effects were present after controlling for many personal and work-related variables including gender, age, occupational type, tenure, and negative affectivity.

And finally, concerning the impact of HPWS on wages, recall that Cappelli and Neumark (2001) found that increased productivity under HPWS was offset by higher wages. The impact of HWPS on wages has been studied by others. For example, Helper, Levine, and Bendoly (2001) found that auto supply organizations that were in a statistically determined "high involvement" cluster had wages that were about 3 to 6 % higher than those that were in high involvement. Bailey, Berg, & Sandy (2001), using data from the apparel, steel, and medical electronics and imaging industries found that there was a positive effect of participation in HWPS on weekly earnings after controlling for years of schooling, experience, and tenure. The authors speculate that this effect might be due to an efficiency wage where the employees have greater discretion and are under a pay for performance plan thus motivating higher performance. Alternatively, when firms engage their workers in higher levels of participation, they probably also provide more training. Also it is possible that the employer may have assigned their most productive employees to the high performance practices.

Reflecting on much of the research reviewed above, it seems that the primary interest has been on studying the impact of HPWS on some outcome after controlling for other variables. It appears that the authors of these studies are less concerned with testing theoretical linkages than showing incremental effects of HR practices after a large set of controls. In contrast, Whitener

(2001) used an analytical approach more common in contemporary organizational behavior research which had a stronger theoretical orientation. She investigated the effect of HR practices on organizational commitment; which is one of the earliest proposed paths of supposed impact HPWS on Performance (e.g. the development of a more highly committed workforce)—and earlier authors had referred to such systems as high *Commitment* work systems (Walton, 1985). In the model she tested, Whitener proposed that individual workers develop a sense of commitment and trust that is exchanged for the organization's support. Thus, perceived organizational support and trust are main drivers of commitment and formal HR practices in the employee's organization either reinforce this message through High Commitment HR or undermine it through High Control HR. She did not include Employee Involvement as an HR practice, but rather the associated HR practices such as investment in training, selectivity in hiring, etc. Interestingly, Whitener used Hierarchical Linear Modeling to identify between-employer effects for each HR practice. This is in contrast to the more common approach of aggregating practices into an overall index of forming statistical clusters of organizations based on patterns of practices. Her results support the general prediction that practices will modify the impact of support and trust on commitment.

Adoption and Diffusion of HR Innovations

As described in some detail above, past research suggests a strong link between HWPS and associated HR practice and organizational performance and growing evidence of linkages to a diverse set of worker outcomes. These facts are known and publicized, especially those regarding organizational performance. Based on this fact alone, it would suggest that there would be quick move to adopt such practices both within and across firms. However, there is

significant variation both within and between organizations in adopting HPWS, suggesting that there are other, organization-specific factors that affect the adoption choice as well as how extensive HR innovation becomes. One major alternative is the *institutional* perspective that emphasizes how organizations adopt practices based on the additional pressures of coercion, normative regulations, and imitation. Organizations sharing the same environment will tend toward similarity in practice. One explanation for variation in adoption is the degree to which an organization is imbedded in a network of organizations that provides both new ideas and advice on implementation.

Erickson and Jacoby (2003) use the concepts of social networks and organizational learning to explain the adoption of HR innovation. In the learning literature (Weick and Westley, 1996), there is a distinction between knowledge that something exists (e.g. an HR practice that shows promise in other organizations) and the tacit knowledge about how to implement, troubleshoot, and customize an HR practice to a specific organization. This implicit knowledge can be gained through both formal and informal contacts with others. External networks are built around industry trade associations, other employer associations, and professional associations. Internal networks can exist within a single, multi-site organization. In one sense, consultants also provide a link to a network although the information is filtered through the consultant. Participation in multiple networks provides opportunities to gain new information, potentially not available to competitors. In a study of diverse establishments in California (stratified on size), they gathered information on network affiliations and HR practice adoption and intensity (percent of workers covered). They found that having multiple network affiliations was positively associated with the number of HR practice innovations as well as the

number of employees who were in teams, covered by TQM, and involved in group meetings, and provided with job-skills training.

In addition to the effects of the network affiliations, Erickson and Jacoby also found that firms that had career employment practices (such as pension plans and internal promotion plans) and employee support policies (such as family leave and employee assistance programs) were also likely to have more high performance work practices. Because these programs are intended to help retention, it is seen as an important part of the HPWS bundle because they help the organization recoup their investment in employee skill development. Finally, there was no effect for union representation of employees on the adoption or extensiveness of the HR practices. We will further discuss the role of unions on adoption and implementation in a later section.

In some early establishment-level research, Arthur (1992) looked at data from a sample of steel mini-mills in order to understand the relationship between business strategy and industrial relations systems. In this study, 34 mini-mills provided industrial relations data from a human resource manager and competitive strategy data from a line manager. Both surveys were mailed out and the final sample of 34 was from an initial sample of 54 mills. The business strategy variables were a combination of low-cost producer, differentiating features, market focus, production variability, and customer type (either market or contract customers). Industrial relations variables included decentralized decision-making, employee participation in problem-solving groups, training, skill level, wage, bonus, and benefit level, due process, and supervision. Using a combination of cluster analysis and inductive reasoning the mills were identified as either high commitment or cost reducing (later labeled "control" in Arthur, 1994) and either low cost producer or differentiation strategy. There was a significant association between industrial relations system and business strategy. The main interpretation is that business strategy has

influence over industrial relations system. However, Arthur (1992) also points out that a union may be able to block a cost-minimizing labor relations move and force management to consider a different business strategy.

Gooderman, Nordhang, and Ringdal (1999) examined predictions from institutional theory concerning the adoptions of HR practices in six European countries. The survey data came from a collaborative research effort between business schools located in different countries and used mail-out questionnaires to personnel managers that were appropriately translated for the host country. Their findings show distinct patterns of HR practices across the six countries with British firms having both collaborative and calculative practices[2] whereas Norway and Denmark emphasize collaborative projects. The authors interpret these national differences primarily in the context of institutional theory, but put stronger emphasis on the within-country forces (such as regulatory) rather than within industry forces that pressure organizations toward similarity in HR practices.

Kostova and Roth (2002) examined the adoption of Total Quality Management by subsidiaries of a multinational corporation. They were interested in the duality of institutional networks; one based on the multinational corporation and the other based on the national and community location of the subsidiary. The TQM initiative was of strategic importance to the company and it was actively trying to transfer the program across the subsidiaries for 3 years prior to the study. The authors distinguished between *implementation* and *internalization* of the program in the subsidiary. Implementation meant the subsidiary had put in the structure of TQM; planning procedures, leaders, process improvement techniques. Internalization meant that

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[2] Calculative practices refer to practices aimed at increasing the alignment of human resources with production requirements. Included are practices such as performance appraisals, individual pay-for-performance plans, evaluation of training. The collaborative approach has a more developmental or humanistic focus and tries to engage employees as active partners. Included are such practices as written mission statements, formal briefings about company strategy, and written communication policies.

there was an overall level of commitment to the TQM program; 'willingness to put a great deal of effort into it', 'talk it up with friends', 'really inspires me'. The result showed that two general institutional forces affected the degree of both implementation and internalization. The first force came primarily from the degree to which the host country was seen as having successful companies using TQM, a great deal of knowledge about TQM and lot of media attention to TQM. The second major force had to do with the level of trust and identification or attachment that the subsidiary has for the parent. These results reinforce those shown above by further demonstrating that non-economic forces are related to HR practice adoption and implementation decisions.

Implementation of HPWS

Along with the study of organizational and contextual factors related to HPWS adoption, there is also an interest in the process of implementing HPWS. One of the more common references here is to the acknowledgement that organizations represent socio-technical systems and the implementation of new social systems such as HPWS will need to coordinate with the needs of the technical system and visa versa. A case study by Manz and Newstrom (1990) illustrates the coordination of self-managing work teams with the opening of a new paper mill (1987). The planning for the development of self-managing teams in the technical context of a new mill was sensitive to the needs of the technical system and may have contributed to the early success.

The managers of the new start-up wanted to avoid a productivity decline when the teams were introduced. Therefore, they hired many technically trained workers from other mills. This influx of experienced talent allowed the mill to avoid early operational problems and reach

satisfactory performance levels early, but the mixing of the highly experienced employees with neophytes caused later conflict which had to be addressed. In this mill, there was extensive team training on communication, conflict management, and feedback giving. In addition, there was a planned evolution of the teams from having a "strong" supervisor role early to a weak role and finally, a disappearing role. This meant that the individuals who were in this job had to be prepared to "wean" the teams off the authority and problem-solving responsibilities of traditional supervisors.

In addition, the supporting Human Resource systems also needed to be flexible. For example, in the original structure of the pay for skill schedule, the highest levels of the pay scale were reserved for those mastering the most complex skills, but added relatively little increase for achievement of the final two steps in the pay schedule. On the other hand, the lower steps were associated with greater rates of pay increase which provide more incentive for lower skilled workers to achieve multiple skills. However, the experienced technicians hired to proved faster 'ramp-up' of operations were already at the higher pay levels and protested the meager rate of pay increase they could achieve by obtaining the highest level of skills. Eventually, the higher pay grades had to be dramatically increased. Another HR policy that was tested by the new work system was the tight restriction on hiring more workers. The workforce felt stretched because of all the operational demands, training demands, and meetings, meetings, meetings. However, the mill management didn't add workers because that would lead to layoffs when the initial workforce reached higher levels of efficiency. Finally, the implementation was perceived as successful because, in spite of lots of complaints, both management and workers were constantly positive about the opportunities in this "new" type of mill in comparison to more traditional work settings.

Vallas (2003) reports on his observations and interviews in 4 unionized paper mills concerning the implementation of Total Quality Management and team initiatives within the same parent company. Because the start dates for the innovation adoptions preceded his research, Vallas was capturing the current operational state of the workplace innovations and through interviews obtaining retrospective descriptions of implementation events. What is striking is the large variation between mills in some core outcomes, such as the extent of hourly worker participation. It appears that the best outcomes were achieved in the mill that had self-initiated the innovation whereas the other mills had adopted it as part of a corporate wide program. Vallas attributes the different outcomes to the likelihood that the 'compliance' programs adopted the corporate language and performance metrics which tended to be most consistent with those of efficiency oriented managers. On the other hand, the self-initiated program yielded some early outcomes that shaped 1) broad inclusion of hourly workers, 2)worker-centered goals that encompass safety and health, and 3)its interconnectedness with plant governance which created greater upward influence for hourly workers.

Organized Labor and HPWS

When an organization's employees are represented by a labor union, there are additional complexities in the introduction and operation of a HPWS. All HR practices are possible bargaining topics and some are mandatory (such as wages). Any changes to these practices will undergo collective bargaining. However, the adoption and implementation will also be affected by some union-specific factors such as the power of the local union, the support of the local union members for the changes, the history of conflict between union and management in the past, the position of the national union on this issue (if there is a national union).

HWPS represents a departure from many traditional practices that have dominated unionized settings (e.g. narrow job definitions, numerous work rules, rigid lines of seniority preferences). It would be misleading to characterize unions, in general, as being either supportive or opposed to HWPS. Rather, it is more accurate to assume unions will strive to fulfill their traditional mission of representing the long term interests of members, other bargaining unit workers, and the union itself. Thus, proposed job structures that threaten future employment of workers will not be accepted without resistance.

Experience in the Paper Industry

In the paper industry, the move to HPWS often associated with new paper mills (Manz and Newstrom, 1990; summarized above). The "re-fitting" of existing paper mills with HPWS was less common. Partly, this was due to traditional work practices having a rich history in the industry. For example, the hierarchy of expertise in different papermaking jobs represented extensive on-the-job training. Alternatives such as job-rotation or self-managing work teams looked quite radical in established mills.

Over the 1980's though, the pulp and paper industry began to change in part because of international currency exchange rates and global competition. Large companies such as International Paper, with a heavy concentration in commodity products that were under price pressure, were faced with continual needs to reduce production costs. Birecree (1993) describes the phases of concessionary strategies adopted by IP in bargaining with the International Papermakers Union International (IPUI). Although the goal of IP was ultimately to reduce labor costs, many of their contract proposals were consistent with HPWS; fewer job categories, greater flexibility in assignment. In fact Birecree notes that by 1983, the team concept was implemented

in all of IP's southern U.S. mills, but that management's bargaining tactics were somewhat coercive. Before IP would invest in capital improvements in a mill, they demanded that contract language would allow re-organization of the work to be more efficient and thus allow a higher return on invested capital. The union would often capitulate because the competitive viability of the mills required capital improvements. This same argument was used for breaking up a multi-mill common bargaining agreement group, thus reducing the power of the local unions.

According to Birecree (1993), IP ultimately changed its bargaining tactics in the mid-1980's because its corporate financial returns were still not satisfactory even though productivity gains had been made. Thus, IP used more hardline tactics such as threatening lockouts and hiring permanent replacement workers. Through this period, bargaining continued to include work re-organization (especially between production and maintenance) and "teaming" in production. But, additional targets were wage premium concessions for Sundays and Holidays. Thus, union's opposition to IP management over the 1980's was not necessarily resistance to HPWS type changes, but the fact that these proposals were bundled with strong wage-concessions.

Experience in a Unionized Brownfield Site

One of the most common assertions about HPWS is that it is more common in Greenfield sites where new operating technology can be implemented along with a new workforce while adopting HPWS. Workers can then be trained in new work methods. Managers can be selected for their experience and skill in working in less hierarchical systems. Human resource management practices can be designed from the ground up with little concern for helping individuals transition from old practices.

A second common assertion is that it is much harder to implement HPWS in settings where the workforce is unionized. Adversarial union-management relations may confound management's attempts to adopt new methods. Unions may be afraid to yield any authority in the design and administration of pay systems, performance appraisal systems, and grievance procedures; especially if this means changing various "earned" worker perquisites through seniority.

Thus, it is interesting to consider case studies where an organization attempts such change. Ichniowski (1992) studied a paper mill that had begun operating in the late 1960's. By the late 1970's the mill had unacceptable rates of return on capital due to falling productivity. Over the years, the mill had increased the size of it production workforce even though it output had not increased markedly. Underlying the inefficient staffing levels was a history of bad management-union relations. The union (UPIU) had called strikes in the early 1970's. The evolution of the labor contract over the decade also took place in a setting where there was high management turnover. Because of the lack of top management continuity, supervisors took on a larger role in making agreements with employees and the union to get the work done. This resulted in a complex history of complicated, inconsistent agreements that the union knew very well, but upper management didn't. Thus, the union had the advantage in settling grievances which became substantial in number (about 80 per month).

In 1983, after careful planning, management proposed sweeping changes to the HR system in the mill. In opposition, the union called for and held a 2 ½ month strike. Finally, the parties came to a settlement and the team concept was adopted including flexible job design, higher pay rates associated with a smaller number of job classifications, training and development, new dispute resolution, and employment security. As a result of these changes, the

mill experienced a $600,000 increase in average monthly labor costs. However, this was more than offset by the increase in monthly revenue by the 2nd year. Along with increased profitability, the mill experienced far fewer grievances (down to 1.6 grievances/month by the 2nd year). The number of recordable accidents dropped from 4 per month to 1.4 after the change. By 1990 this mill was the most productive in North America with the highest paid paper-workers.

In another case study of the Powell River Paper Mill in Canada, Hayter (1997) describes almost 15 years of management-union conflict and negotiation over issues concerning downsizing and the implementation of some aspects of high performance work systems; primarily flexible job classifications. Additional changes attempted were worker participation in decision-making, having union members visit customers, rivals, and equipment suppliers. Both Union and management agreed on the value of training; but in the face of the relentless downsizing, it was difficult to administer. No conclusions were offered here except to emphasize the difficulties in implementing any of the HPWS while experiencing continual layoffs.

Experience in the Automobile Industry (UAW and Chrysler)

Hunter, Macduffie, and Douget (2002) reported a longitudinal field study of the implementation of work teams, reduced job classifications, and skill-based pay in six manufacturing plants of Chrysler Corporation during the years 1987-1993. Chrysler was the last of the Big 3 auto manufacturers to attempt work reform by the early 1980's. At the national level, Chrysler and the UAW adopted general language, the Modern Operating Agreement (MOA) in early 1986. The local union and plant management agreements containing specific

MOA language had to be accepted by majority vote by the members of the local unions in each of the plants. Although this approach would, on the surface, appear to increase worker buy-in to the change, there were differences in the degree to which the plants were at risk for closure due to product changes in upcoming years. For example, in two plants that eventually adopted the MOA, the plan was initially rejected by the local workers. Only after Chrysler management strongly suggested that future corporate investment in modern technology for these plants depended on MOA adoption did the workers narrowly approve the plan. At the other extreme, managers and union officials at a plant in New Castle, Indiana agreed to proactively pursue the adoption of the MOA and were the first plant to establish its work teams. Thus, at some locations there seemed to be a more forcing approach taken whereas in another there was a fostering approach. Logic would suggest that fostering would create a more receptive workforce than forcing when it comes to employees' discretionary contributions in support of the change.

Another important difference between the plants lies in the concurrent level of risk associated with closure. That is, at the same time workplace innovations were being introduced to the plants, the corporation was continuing to streamline operations through plant closures. Several of the plants under study were more likely to close than others though none were closed during the study period. The authors believed that workers in higher risk plants would work harder, but show poorer attitudes towards the change than workers at plants that were not at risk. That is, the former workers (at-risk) know their jobs are at risk and that this program may be the only way to save them. However, their attitudes towards the MOA would be negative because of lingering doubts about job security.

Through their initial field work in the late 1980's and subsequent phone survey that yielded 782 complete data records from workers across the 6 plants, the authors were able to

look at both plant differences and individual differences associated with worker attitudes towards the MOA and their behavior. Their conclusions are:.

- Workers may not initially embrace workplace reform because it threatens seniority-based gains they achieve through collective bargaining

- However, they will be positively inclined towards change when change:

    o is legitimized and supported by national union agreement

    o enhances their individual economic standing, even modestly

    o improves daily work experiences through traditional enrichment of tasks and providing opportunities for voice

    o improves job security through improving plant's competitiveness

    o achieves effectiveness through mutual gain rather than zero-sum tactics

Experience in the Aircraft Industry

Kleiner, Leonard, and Pilarski (2002) were interested in the effects of labor relations climate and the introduction of a Total Quality Management Program on labor productivity in single, large plane manufacturing plant (referred to as Big Plane or BP plant). The United Auto Workers (UAW) was the union during the time of the study, 1974-1991. During this interval, there were frequent changes in Company President (4) and Union Presidents (6). This led to variation to the matching of individual backgrounds and leadership styles in these two important leadership positions. Over the 18 years of the study, the BP plant experienced 3 strikes of 1 to 3 months as well as a 'work to rule' slowdown. Toward the end of the study period (1989), a TQM program was implemented. This program was modeled after the well publicized success of the New United Motor Manufacturing, Inc. (NUMMI) joint venture between GM and Toyota

which included a nontraditional collective bargaining agreement with the UAW. The NUMMI

plant in Freemont, California had gone from being one of the worst plants in GM to one of the

best on productivity and quality measures as well as labor relations measures.

The key issue of interest in this study was the impact of different labor relations climates,

created by different leadership styles in the top management and top union positions, and the

TQM program on productivity. The research was based on data that represent the presence or

absence of some feature or event (a particular union leader, a particular company manager, a

strike, etc.) and productivity as measured by the difference between expected and actual labor

costs. In order to better interpret the effects, the researchers interviewed both union and

management personnel who knew the specific leaders and could provide information on

leadership style (such as confrontational or cooperative)

Some of the findings are mundane; strikes and slowdowns are associated with lower

productivity. However, others are fascinating. For example, the style of the plant president

varied from tough, autocrat at the beginning to more collaborative styles in the middle and back

to a tough autocrat. The union presidents went from being moderate in the beginning to being

militant in the middle to being cooperative to being a traditional adversary. Through all of this,

the plant gradually implemented first Quality Circles and then TQM which were then associated

with more or less union and management support. Beyond the negative impact of the strikes, the

data showed that the TQM program detracted from productivity and the final, autocratic

company manager was associated with the highest level of productivity. Within the company,

the TQM program was a top-down initiative from corporate. It had the buy-in from local

management and support from union leadership for its early stages. They even hired the

executive who was in charge of implementing TQM at NUMMI to implement it at BP.

However, the demands for production and the reluctance of supervisors to release their crews for TQM training undercut the need to create a workforce skilled in TQM methodologies. Furthermore, the authors suggest that the supervisors felt insecure about their jobs because of the TQM program. The immediate impact of all this was product delays and decreased productivity. The union leader was not re-elected and the company recruited the new, autocratic president who presided over the demise of TQM and instituted a traditional, top-down, autocratic management style. The new union leader ran on a platform of getting rid of TQM and going back to a more adversarial relationship with management.

In summary, this case once again shows the importance of studying union dynamics as part of the HR practice adoption and implementation process. The democratic nature of a union allows it to shift its leadership style to meet the threats that may be evolving from earlier union president actions. From the management side, this means that their union contemporary can change from a "partner" to an "adversary". It also highlights the full spectrum of transformational HR practices in an organization; from adoption to implementation to removal. The adoption process at BP was not a grass roots approach and this may have eroded support. Even hiring a person well versed in implementing TQM in a site that had some contentious labor relations could not overcome the initial barriers. Given the negative impacts associated with TQM in this particular location, terminating it would seem to be the rational, not just the politically correct thing to do. On a final note, the ending point of data collection is 1991 and the publication of the article is 2002. The authors indicate an interest in re-engaging the company for an update on what happened in the 1990's. It would appear to be a useful venture.

The Union Perspective

Providing a view based on union president's perceptions of employee involvement in the pulp and paper industry, Kriesky and Brown (1992) analyzed survey responses from a large sample of local unions in North America (N = 303). Sixty percent of the respondents said that their local union was not supportive of the mills' employee involvement programs. There were also written comments which expressed lack of interest, if not outright hostility towards the programs. Prior concessionary bargaining is associated with a less favorable view of EI, as is unilateral management initiation of the program. When the union had some input on picking team members, there was generally more support. Reducing job classifications, which is often associated with management's desire for more flexibility, is associated with negative attitudes towards EI. Support was higher if issues discussed included both those of primary interest to workers (e.g. safety, holidays) as well as plant effectiveness. As far as how the EI program affects workers' support of the union, it appeared that programs that were either very effective or ineffective led to greater support of the union.

Although a cooperative relationship between union and management is usually seen as a facilitator of EI adoption and implementation, Perline and Sexton (1994) found that managers' perception of labor-management cooperation seems to include union input on fewer issues while providing more information. Perline (1999) added further contextual information to this point by comparing survey results of national and international union officials from 1968 and 1997. It appears that more union leaders want input on a much wider range of issues in collective bargaining. These issues include general management responsibilities such as determination of financial policies, determination of customer relations, scheduling of operations, and

determination of property protection measures. Thus, more union leaders at the national and international levels desire a role for unions in these matters.

Wagar (1997) found that in 3 samples of Canadian employers, both union and management officials tended to see good labor relations climate as associated with a better firm performance. On a related note, in another study of union officials in the pulp and paper industry, Kriesky and Brown (1992) provide an interesting interpretation of the role of labor relations climate and Employee Involvement programs. Gaining the union's commitment to the program is critical to its success. Commitment will be based on first management's ability to aid production through EI and then the industrial relations climate. EI meetings cannot be simply gripe sessions with no results. Management must be able to funnel the ideas into useful projects.

Reshef, Kizilos, Ladford, and Cohen (1999) were interested in studying how union member participation in an EI program affected both their perceptions of the EI program as well as their attitudes as to whether or not the union should become more involved in the EI program. This study took place in a telephone company where the employees were being organized into self-managing teams focusing on a particular customer service. They found that participants in the program had more positive attitudes towards the program than non-participants and participants who had volunteered had more positive attitudes towards the program than non-volunteers. Furthermore, support for EI was positively related to more union involvement in the EI program, especially when the perceived durability of the program was low. This suggests that union members view their union's involvement as an important component in saving an otherwise faltering program.

Blyton and Bacon (1997) document the changing role of seniority in promotion decision among steel-making crews in the United Kingdom. In their view, traditional labor union control

over promotions through seniority rules played functional roles for the both the union and management through the 1960's. As pressure for productivity improvements increased so did management's interest in reducing the role of seniority. Management viewed personnel placement decisions as more important in a changing technological work environment and other factors besides seniority were relevant to the decision. In addition, elimination of work rule restrictions and flexibility in task assignment required relaxation of the traditional seniority preferences and less distinct job categories. Thus, the authors note the changing occupational culture of the steel-making jobs that have become more teamwork-oriented than seniority and hierarchical. They suggest that this new culture may eventually support workers' collective solidarity because there are fewer hierarchical distinctions between workers.

Another question of interest to unions is the role of the union in the administration of HPWS. In 1987, Eaton (1990) surveyed local unions in the upper Midwest U.S.(75% in Wisconsin and almost 25% in UPIU) whose bargaining unit was involved in a employee involvement program (ie. participative, cooperative, team system). Roughly 42% of those unions initially contacted had such programs. The survey questions concerned 3 major issues; 1) the degree to which the union can select the personnel responsible for set-up and administration of the program, 2) the union's influence on choice of representatives, attendance at meetings, setting the meeting agenda, and so on, and 3) the union's monitoring of the program. The level of union involvement was related to the amount of training available, program initiation by a party other than management, perception that the international union is in favor of such programs and/or has a policy that is generally supportive.

Eaton (1994), in 1990, subsequently studied the survival of the programs identified in the first survey and factors associated with survival. She found that labor-management relations

(such as perceptions of trust and any recent concessions granted by the union) were associated with survival; trust had a positive relationship and concessions had a negative relationship. She also found that the structure of the involvement program was related to survival. If there were even weak restrictions on the discussion of bargaining issues in the participation groups, then the program was less likely to survive. A final note of interest in this study was the difference in perceptions of union members and managers on whether or not an involvement program was still operating. Managers were more likely to see a program as still operating than were union representatives.

One final note here is whether or not union presence has any impact on the outcomes of high performance work systems. Osterman (2000) examined changes in wages and layoffs in a sample of diverse organizations sampled through the National Survey of Establishments. He found that High Performance Work Systems was associated with more frequent layoffs if the establishment was non-union whereas there was no effect for High Performance Work Systems on layoffs when a union was present. He interpreted this to mean that unions are effective in deploying their power to protect workers from layoffs.

From the examples given above, it is clear that adoption and implementation of HWPS does occur in unionized settings and that the role of the union varies. What accounts for this variation? One interesting perspective comes from Frost (2000) who was interested in how differences in local union capabilities affected the outcome of work restructuring in steel mills.

Union negotiations have become more decentralized over the past 20 years such that local unions have more influence over bargaining and settlements than before. Rather than having centralized bargaining at the national or regional level, the local unions bargain with local management. This approach allows more responsiveness to local economic conditions as well as

the preferences of the local workforce. However, in her case studies of 4 steel mills, Frost

noticed strong differences in the level of engagement of the local union with management

concerning topics of workplace transformation. Some local union Presidents were quite passive

and allowed management to implement workplace transformation with little or no input from

local union members. In other cases, the local union rebuffed a management offer to make

substantial investments in modernizing production technology in exchange for simplifying job

classifications for purposes of more efficient assignment of personnel (primarily combining

operation and maintenance jobs). Eventually this proposal was negotiated at the District Union

level, but the local members still had little input. In both cases there were shortcomings in the

implementation of the new work systems as well as the outcomes for workers. For example, the

workers who had been operators were unable to qualify for the new higher paying

operator/maintenance jobs.

On the other hand, in another mill, when management offered productivity enhancing

equipment in exchange for workplace transformation that would improve labor efficiency, the

local union president responded by first obtaining a consultant's report to determine whether or

not the proposed modernization techniques could actually deliver the anticipated cost savings.

When the independent consultant verified the proposed savings, the local union president then

managed to bargain for job rights for current workers.

Frost (2000) depicted the differences between these local unions as differing *capabilities*.

The components of these capabilities are 1) ability to access information (such as the consultant),

2) to educate and mobilize the workforce (in order to gain power in negotiations), 3)

communicate with management at multiple levels, and 4) access decision-making at multiple

points. Though the research was based on a case study approach, there are some very valuable

ideas for industrial relations researchers who want to examine workplace transformation.

Concluding Remarks on Literature and Introduction to Study

The research literature review presents a rich and diverse set of findings and ideas

relating to High Performance Work Systems. There has clearly been research activity in the

domains suggested in the introduction. First, there is clearly an interest in demonstrating the

impact of HPWS on organizational outcomes. Second, there is a growing interest in looking at

HPWS and worker outcomes. Third, there is a growing interest in the adoption and diffusion of

HPWS, especially within large companies. Fourth, there is an interest in implementation of

these systems. Finally, there is a continual interest in the role of labor unions in the adoption and

implementation of these systems. The next part of this report will present the research methods

and early results from a survey study done as part of this project. Rather than build an elaborate

theoretical rationale for the research design, the questions from the research proposal will be

listed here.

The questions that drive this study are four-fold.
1. How prevalent are non-traditional work systems in the pulp and paper industry?
2. What organizational and human resource factors seem to condition the spread of non-traditional work systems, whether across different firms, mills, or production areas?
3. What effects do HR innovations have on the performance of business units within the industry (as measured by percent uptime, percent culled paper, on-time delivery, etc.), holding constant relevant technical variables?
4. What effects do HR innovations have on the quality of employment experienced by hourly employees (as measured by various industrial attitudes and behaviors, wages, and other job rewards)?

The results presented here will only address the 1st question and only then with limited data. It is anticipated that a somewhat more comprehensive report can emerge at later date if on-going data collection continues with some measure of success.

Methods

One of the common criticisms of much industry-sector organizational research is that the available sample is not representative of the industry. For example, there might be a bias based on size in that larger firms may have the resources to contribute to the research effort. Or firms that are closely aligned with the sponsoring research center may be more likely to be represented in final samples than those that are not. With that in mind, we began with a sampling frame that would better yield a representative sample of the pulp and paper industry. Our sampling process began in late 2002, early 2003. We sampled from the electronic database representing the 2002 Lockwood Post Directory.

In light of our goal to represent the U.S. industry, we stratified our sample based on region, union/non-union, and product (e.g. groundwood, linerboard, etc.). The 4 categories for product were determined by an industry member who was on our industry liaison group. Regional categories were created by associating geography (e.g. East, West, North, South) with some knowledge of the history of the industry. We created 4 categories representing West, Northeast, Southeast, and Midwest. These categories were not meant to become variables of interest, but rather to maintain geographic representativeness in our sample.

We created lists of mills for each of the 16 subpopulations. Then we randomly chose sufficient mills from each trying to equally represent union and non-union mills, in order to achieve an initial target sample of 300 mills. This list was then subjected to review by knowledgeable industry professionals who identified mills that were misclassified by Lockwood-Post, had been closed, or for other reasons. This yielded a final sample of 243 mills which appears in Appendix 1.

Lockwood Post provides descriptions of the paper machine(s) in each mill based on manufacturer, speed, width, and trim. We wanted to learn about two paper machine operations for each mill that had them. Therefore, we sampled paper machine descriptions. Because our

research design depended on multiple respondents per mill, we needed to provide each with a common point of reference when asked to describe the HR practices associated with each paper machine.

The actual surveys were reviewed by industry individuals and union officials. Problem items were reworded or deleted. Because survey length was a concern, it was decided to make fewer sections of the survey repetitious which would detract from our ability to demonstrate inter-rater agreement, but hopefully improve our response rate.

The industry reviews helped us sharpen our focus. Unfortunately, the review by union officials was followed by a rejection of our research. Although bridges have not been completely burned on this aspect of the research, we have not pursued it further.

Survey administration was carried out by the Survey Research Center (SRC) at the University of Georgia. SRC has computer-aided survey/interview administration and has the capacity to handle large, mail-out or phone-based surveys where follow-up will be necessary to elicit responses from the target respondent population.

We began with a pilot study of 20 mills in the Fall of 2003. The SRC would first telephone the identified mill in the sample, and try to make phone contact with someone. This would often lead to knowledge about disconnected phones, closed mills, or unwillingness to participate. After successive attempts, 15 mills were considered 'active' and respondent contact information and paper machine identity verified. Surveys, participant consent forms, and an information flyer were mailed to the relevant individuals in the mills. We were interested in getting information from the mill production manager, the mill HR director, and a machine superintendent. Thus 3 different surveys, targeted to the appropriate individual, were mailed to each mill. This mail-out was then followed by a regular reminder and mail-out of replacement surveys, if needed. The reminders began with post cards and were then followed by phone calls. For the pilot study, this yielded a total of 3 surveys (of the 45 individuals contacted).

After some extended discussion about the low yield, we decided to proceed with the larger sample with some additional activity. Of the sample, a substantial number of mills come from large companies. We thought that an initial contact and endorsement from headquarters might improve the chances participation at the mill level. Therefore, a significant number of mills were withheld from the SRC operation until an attempt to contact the various corporate headquarters was made. Of those mills that were not on the 'hold-out' list, all were contacted

and the survey administration procedure described above for the pilot sample was followed. The results as of Sept. 8, 2004 appear in Table 1 and show some degree of success in survey completion. The statistical results described a later will be based on the available sample as of Sept. 2, 2004 which numbers 30 surveys.

Table 1

Survey Contact and Return Results as of Sept 8, 2004

<u>Out of 114 total mills culled from 1st wave:</u>

26 refusals out of 20 mills
7 ineligible respondents from 5 mills
9 non-working or disconnected numbers at 4 mills
3 wrong addresses for 1 mill
Total inactive mills: 6

Total still active: 108 mills

<u>Out of 108 active mills</u>:

107 mills have been contacted
244 questionnaires have been mailed
38 questionnaires have been completed representing 31 mills

Measures.

The surveys were designed to gather a great deal of relevant information in an efficient manner while addressing some of the common shortcomings in much of the previous research on high performance work system. The full surveys appear in Appendix 2 and represent the 4 targeted respondent populations. As mentioned above, the union leader survey has never been administered, but is a revised version based on union official comments.

Of interest for this report are the data collected on HR practices. We reviewed many of the previous studies of workplace transformation and high performance work systems in previous industry studies (e.g. Applebaum et al., 2000; Ichniowski et al.1997). From these and other studies, we culled a list of 10 HR practices that were characteristic of many of the studies, though not exhaustive. We presented 9 of these practices in a grid which allowed the respondent to indicate if the practice has ever been used, when it began, whether still in effect, the perceived effectiveness, and if and when it was terminated. Each survey also included a glossary defining the terms. This glossary appears in Appendix 3. Getting the start and stop dates would potentially allow us to create a panel data design. This was the approach used by Ichniowski et al. (1997). It would require us to get annual paper machine productivity data which was a bridge we haven't yet crossed.

Results

The level of analysis reported here is the paper machine operating crews. Each respondent was asked to describe the HR practices for each of 2 paper machines using the grid. At the time of the preparation of this report, a total of 30 surveys were available. Table 2 shows the results of surveys received as of Sept. 3, 2004.

<div align="center">

Table 2
Results for Prevalence of Practices

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		Ever used (Yes or no) % Yes	If yes, Year began (% before 1996)	Practice still in effect? (Yes or No) (% Yes)	If yes- How effective has it been? 1= Not at all 2= a little 3=somewhat 4=quite a bit 5=a great deal	If Not in effect – When did it end?
1	Self-directed work teams	33%	45%	75%	3.9	
2.	Employee problem-solving groups (including quality circles)	46%	67%	61%	4.0	
3	Job rotation	39%	67%	100%	4.0	
4	Total quality management/continuous quality improvement	54%	89%	77%	3.7	
5	Gain sharing compensation program	37%	44%	77%	3.1	
6	Employment security policy	11%	0%	100%	3.0	
7	Pay for skill program	23%	67%	78%	2.3	
8	Profit-sharing/bonus program	40%	27%	92%	3.1	
9	Removal of shift supervisors/ delayering	29%	36%	91%	3.6	

First for self-directed work teams, about 1/3 of the paper machine operations have adopted them with about half of those being adopted prior to 1996. About 25% of those team systems have been dropped. The average perception of effectiveness yields "quite a bit."

Next, for employee problem-solving groups, 46% of the paper machine operations have adopted them and 2/3 of those prior to 1996. About 60% of those are still operating. The average perception of effectiveness is "quite a bit."

For job rotation, about 40% of paper machine operations have adopted them, 2/3 of those were adopted prior to 1996 and all of them are still in operation. It is also seen as having "quite a bit" of effectiveness.

For Total Quality Management or Continuous Improvement Programs, about 50% of the paper machine operations have adopted them, 90% were adopted prior to 1996 and about 75% are still in operation. These were seen as a little less effective than the first 4 practices, but still best interpreted as "quite a bit".

For Gain-sharing compensation, about 37% had ever adopted them, 44% prior to 1996, and about 25% have been dropped. The perceived effectiveness was quite a bit lower than the first 5 practices; seemingly yielding a "somewhat effective" response, on average.

For Employment Security policies, this was much rarer in that only about 10% of the paper machine operations had ever adopted this practice, none were adopted prior to 1996, but all are still in effect. They appear to be somewhat effective.

For Pay-for-skill programs, about 25% of the paper machine operations have adopted them, about 2/3 prior to 1996, and about 75% are still in effect. They are seen as less effective than the practices listed above; more like a "little" effective.

For profit-sharing programs, the adoption level has been about 40%, with only about 25% of these coming prior to 1996. Almost all of these (92%) are still in effect with an effectiveness rating of "somewhat" effective.

Finally, for the removal of shift supervisors and/or de-layering of the organization, we see that this has been adopted by about 30% of the paper machine operations, with about only 1/3 of these coming prior to 1996. Almost all of them are still in effect (91%) and they are seen as somewhere between "somewhat" and "quite a bit" effective.

One final result can be tallied from these preliminary data. If we collapse across the 9 practices and calculate the number of adoptions prior to 1996 as opposed to 1996 and beyond,

we can get some idea of pace of adoption. There are 99 incidents of practice adoption and 60 of these occurred prior to 1996. Thus, just about 40% have occurred in the past 8 years.

Discussion

This report has provided an extensive literature review covering the ever-expanding research on high performance work systems. As this literature evolved over the course of this project, it is clear that we anticipated many of the issues that are still of interest to academic community. We have designed our study to better deal with the measurement issue, the sample representativeness issue, the cross-level phenomena issue, and the worker-outcomes issue. We must also acknowledge that we did not anticipate the growing interest in 'social capital' as an explanatory mechanism through which HPWS impacts organizational performance. Nor did we anticipate the interest in communication networks and network analysis methods that seem to be becoming more popular.

We were pleasantly surprised to find quite a few studies that originated in the pulp and paper industry, though that trend seems to have slowed down. Those studies that were reviewed represent an interesting mix of case study and survey research that can be used to highlight high performance work system applications in this industry.

We were also pleasantly surprised to see the evolving research literature on labor relations and collective bargaining as they pertain to high performance work systems. There are examples of rich case studies, evolving frameworks for examining the impact of unions, and survey research related to these frameworks. Much of this existed prior to the initiation of this research and was incorporated into the research questions and design of the study.

The actual research has been quite disappointing until recently. The proposed research anticipated a relatively quick survey research study that would provide a basis for a quantitative analysis of the prevalence and effectiveness of HPWS in the pulp and paper industry as well as the other research questions that were of interest to the overall academic community. We felt the 'heavy lifting' would be needed for our access to corporate level contacts in order to provide firm-level data. There was also some concern about how to obtain the actual productivity data from the mills and/or firms because these were not publicly available and, according to industry sources, very closely guarded.

We actually spent a good deal of our initial year trying to work out a plan for obtaining such productivity data. We learned that for Newsprint mills, there was a publicly available source and thus we included all Newsprint mills in our sample. We also learned that there were sophisticated mathematical models of potential output and productivity, but for our purposes, this could only supplement and maybe help us understand the actual productivity. Thus, we realized that we would eventually have to contact the 'owners' of the data and try to convince them to turn over the data for specific mills. This effort only makes sense if we have sufficient survey data on which to conduct meaningful statistical analysis; thus it has not yet begun.

Our small, but growing database does provide some reason to be cautiously optimistic. The results reported so far, seem to provide a pattern that is meaningful in the sense that the levels of practice adoption are roughly similar to those reported in other, cross industry studies of HPWS (e.g. Lawler et al., 2001). The small sample also provides a starting point for discussing these practices with industry insiders which possibly could lead to better participation rates from more targeted sets of mills. We will have to wait and see.

Over the course of the last 3 years, the project and its team members have experienced continuous setbacks and frustration. We rarely came across an audience, either industry or academic, that wasn't very interested in the topic of HWP. Yet, the industry, both management and union, have been difficult to engage. Time lags between meaningful interactions can take weeks if not months to try to simply talk to one another. With the exception of one early interaction with a Corporate level person in one company, we had very little sense that any large company was going to get behind this project and provide us with a large mill-level data set that would get us started.

Additionally, we were set back by a delay in the development of 'Participant Agreements' which may have then created a huge barrier to even initial conversations. I know of two potential relationships that went back and forth on e-mail for about a month or two, but just 'stopped' once I broached the 'participant agreement' by sending them one and simply saying they may want to work within this kind of arrangement.

An alternative approach to our research may have been to establish contact within large companies through mail-out invitations to participate in a study (for example to a corporate HR person). Getting several large firms to agree to participate might have yielded a large number of mills. However, as mentioned earlier, the hope was to maintain a representative sample, which

this approach would not have yielded. Through our contacts with other industry center researchers we heard that this approach can work with time.

Another approach would have been to actually conduct our Phase 2 research plan (which included much more on-site data collection) first and then supplemented it with mail-out survey data. This would have allowed us to build a stronger contact base in the industry, but not provided us with sufficient data to do extensive quantitative analysis on the research topics of initial interest to us.

In conclusion, we have a small start on an ambitious research project. The research design is still oriented towards yielding results that are of interest to the field. Optimistically, there can be an updating report that provides some of these meaningful results.

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Appendix 1

Initial Sample of Mills

Company Name	ADDRESS	CITY	STATE
Alabama River Newsprint Co.		Perdue Hill	AL
Georgia-Pacific Corp.	7530 Hwy 114	Pennington	AL
Huhtamaki Food Service Inc.	608 Mathis Mill Rd	Albertville	AL
International Paper Co.	16504 County Rd 150	Courtland	AL
MeadWestvaco Containerboard	1611 County Rd 85	Stevenson	AL
U.S. Alliance Coosa Pines Corp.	17589 Plant Rd	Coosa Pines	AL
Georgia-Pacific Corp.	Mill Supply Rd	Crossett	AR
Green Bay Packaging Inc.		Morrilton	AR
International Paper Co.	5201 Fairfield Rd	Pine Bluff	AR
Temple - Inland	1701 Jefferson Pkwy	Pine Bluff	AR
Abitibi-Consolidated Inc.	Spur 277	Snowflake	AZ
California Paperboard Corp.	525 Mathew St	Santa Clara	CA
Cellulo Co.	81 M St	Fresno	CA
Fontana Paper Mills Inc.	13733 E Valley Blvd	Fontana	CA
Newark Pacific Paperboard Corp.	6001 S Eastern Av, City of Commerce	Los Angeles	CA
PABCO Paper	4460 Pacific Blvd	Vernon	CA
Pomona Paper Co.	1404 W Holt Av	Pomona	CA
Shasta Paper Co.	21091 Hawes Rd	Anderson	CA
Smurfit Newsprint Corp. of California	2205 W Mt Vernon Av	Pomona	CA
Smurfit-Stone Container Corp.	2001 E 57th St	Vernon	CA
Specialty Paper Mills Co.	8834 S Millergrove Dr	Santa Fe Springs	CA
Cellu Tissue Corp.	2 Forbes St	East Hartford	CT
Dexter Corp.	2 Elm St	Windsor Locks	CT
Inland Paperboard and Packaging	Rte 163	Montville	CT
Kimberly-Clark Corp.	58 Pickett District Rd	New Milford	CT
Simkins Industries Inc.	259 East St	New Haven	CT
Smurfit-Stone Container Corp.	125 Depot Rd	Uncasville	CT
Windsor-Stevens Inc.		Poquonock	CT
International Paper Co.	375 Muscogee Rd	Cantonment	FL
Smurfit-Stone Container Corp.	N Eighth St	Fernandina Beach	FL
Smurfit-Stone Container Corp.	9469 Eastport Rd	Jacksonville	FL
Augusta Newsprint Co.	2434 Doug Bernard Pkwy	Augusta	GA
Caraustar Ind	3500 Joe Jerkins Blvd	Austell	GA
Georgia-Pacific Corp.	393 Fort Howard Rd	Rincon	GA
Georgia-Pacific Corp.		Cedar Springs	GA
International Paper Co.	4278 Mike Padgett Hwy	Augusta	GA
International Paper Co.		Savannah	GA
Interstate Paper L.L.C.	2366 Interstate Paper Rd	Riceboro	GA
Riverwood International Corp.	100 Riverwood International Way	Macon	GA
Smurfit-Stone Container Corp.	101 Pine St	Cedartown	GA
Sonoco Products Co.	2490 Marietta Rd NW	Atlanta	GA
SP Newsprint Co.	709 Papermill Rd	Dublin	GA
Visy Paper Inc.	1800 Sarasota Pkwy	Conyers	GA
Tama Paperboard	117 Siegel St	Tama	IA

Weyerhauser	4600 C Street SW	Cedar Rapids	IA
Potlatch Corp.	Mill Rd	Lewiston	ID
Ahlstrom Filtration Inc.	1200 E Elm St	Taylorville	IL
Madison Paper Co.	13101 S Pulaski Rd	Alsip	IL
Rock-Tenn Co.	705 N Farnsworth Rd	Aurora	IL
SCA Tissue North America	13101 S Pulaski Rd	Alsip	IL
Huhtamaki Food Service Inc.	6629 Indianapolis Blvd	Hammond	IN
Premier Boxboard L.L.C.	2585 E 200 North	Cayuga	IN
Rock-Tenn Co.	800-A S Romy St	Eaton	IN
SCA Tissue North America	240 Waite St	Gary	IN
Smurfit-Stone Container Corp.	S Main St	Carthage	IN
Smurfit-Stone Container Corp.	455 W Factory St	Wabash	IN
Smurfit-Stone Container Corp.	40 Chestnut St	Lafayette	IN
Ahlstrom Engine Filtration, L.L.C.	215 Nebo Rd	Madisonville	KY
MeadWestvaco Corp.	1724 Westvaco Rd	Wickliffe	KY
Weyerhaeuser Co.	1500 Commonwealth Dr	Henderson	KY
Boise Cascade Corp.	4200 Hwy 190 W	DeRidder	LA
Georgia-Pacific Corp.	W Mount Pleasant Rd	Zachary	LA
International Paper Co.	705 Colliers Ln	Bastrop	LA
International Paper Co.	300 Williams Lake Rd	Pineville	LA
Riverwood International Corp.	1000 Jonesboro Rd	West Monroe	LA
Smurfit-Stone Container Corp.	Mill St, C/S 3700	Hodge	LA
Tembec, Inc.	2105 Hwy 964	Saint Francisville	LA
Temple - Inland	4th St	Bogalusa	LA
Valentine Paper Inc.	139 Joe Brown Rd	Lockport	LA
Weyerhaeuser Co.	P.O Box 377	Campti	LA
Bay State Paper Co.	892 River St, Hyde Park	Boston	MA
Cascades Diamond Inc.	4145 Church St	Thorndike	MA
Creative Paper Co.	175 James St	Worcester	MA
Crocker Technical Papers Inc.	431 Westminster St	Fitchburg	MA
Fox River Paper Co.	295 Park St	Housatonic	MA
Merrimac Paper Co., Inc.	9 S Canal St	Lawrence	MA
Newark Atlantic Paperboard Corp.	250 Canal St	Lawrence	MA
Parsons Paper Co.	84 Sargeant St	Holyoke	MA
Rexam DSI	Front St	West Springfield	MA
Seaman Paper Co. of Massachusetts, Inc.	51 Main St	Otter River	MA
Sonoco Products Co.	200 S Water St	Holyoke	MA
Simkins Industries Inc.	201 River Rd	Catonsville	MD
Domtar	60 Main St	Woodland	ME
Eastern Paper Co., Inc.	50 Katahdin Av	Lincoln	ME
Fraser Papers Inc.	25 Bridge St	Madawaska	ME
Georgia-Pacific Corp.	Portland St	Old Town	ME
Great Northern Paper, Inc.	50 Main St	East Millinocket	ME
Great Northern Paper, Inc.	1 Katahdin Av	Millinocket	ME
International Paper Co.	River Rd	Bucksport	ME
International Paper Co.		Jay	ME
Madison Paper Industries	Main St	Madison	ME
MeadWestvaco	35 Hartford St	Rumford	ME
Sappi Fine Paper North America		Hinckley	ME
Wausau-Mosinee Paper Corp.	1 Mill St	Jay	ME

French Paper Co.	100 French St	Niles	MI
Great Lakes Tissue Co.	437 S Main St	Cheboygan	MI
International Paper Co.	P.O. Box 211	Quinnesec	MI
IPMC, L.L.C.	9125 W Jefferson Av	Detroit	MI
Manistique Papers Inc.	453 S Mackinac Av	Manistique	MI
Rockford Paperboard Inc.	7734 Childsdale Rd NE	Rockford	MI
Smurfit-Stone Container Corp.	One Superior Way	Ontonagon	MI
Sorenson Paperboard Corp.	6240 E US Rte 223	Palmyra	MI
White Pigeon Paper Co.	15781 River St	White Pigeon	MI
Hennepin Paper Co.	100 Fifth Av SW	Little Falls	MN
International Paper Co.	100 E Sartell St	Sartell	MN
Liberty Paper Inc.	13500 Liberty Ln	Becker	MN
Sappi Fine Paper North America	2201 Avenue B	Cloquet	MN
Stora Enso North America Corp.	100 N Central Av	Duluth	MN
UPM Kymenne	115 First St SW	Grand Rapids	MN
Bowater		Grenada	MS
Coastal Paper Co. (Cellutissue)	1321 S Magnolia Dr	Wiggins	MS
Weyerhaeuser Co.	Carson Rd	Columbus	MS
Blue Ridge Paper Products Inc.	175 Main St	Canton	NC
International Paper Co.	865 John L Riegel Rd	Riegelwood	NC
International Paper Co.	518 S Old Franklin Rd	Spring Hope	NC
Laurel Hill Paper Co.	126 1st St	Cordova	NC
U.S. Packaging, Inc.	953 Alma Rd	Maxton	NC
American Tissue Mills of New Hampshire, Inc.	116 Lost Rd	Winchester	NH
Lydall Technical Papers	Chestnut Hill Rd	Rochester	NH
Monadnock Paper Mills, Inc.	117 Antrim Rd	Bennington	NH
Pulp & Paper of America (PPA)		Gorham	NH
Wausau-Mosinee Paper Corp.	3 Mechanic St	Groveton	NH
Bellcorp (was Enron)	950 River Dr	Garfield	NJ
Crown Vantage Inc.	404 Frenchtown Rd	Milford	NJ
FiberMark, Inc.		Hughesville	NJ
FiberMark, Inc.		Warren Glen	NJ
Recycled Paper Board Inc. of Clifton	1 Ackerman Av	Clifton	NJ
Bio-Tech Mills Inc.	2822 State Rte 29	Greenwich	NY
Buffalo Paperboard Corp.	470 Ohio St	Lockport	NY
Felix Schoeller Technical Papers Inc.	179 County Rte 2A	Pulaski	NY
Flower City Tissue Mills Co.	700 Driving Park Av	Rochester	NY
Georgia-Pacific Corp.	327 Margaret St	Plattsburgh	NY
International Paper Co.	1000 Shore Airport Rd	Ticonderoga	NY
Irving Tissue Inc.	1 Eddy St	Fort Edward	NY
Lafayette Paper L.P.	112 Forge Hill Rd	New Windsor	NY
Lydall, Inc.	68 George St	Green Island	NY
McIntyre Paper Co., Inc.	131 Mill St	Fayetteville	NY
MeadWestvaco Specialty Paper	547A Sissonville Rd	Potsdam	NY
Mohawk Paper Mills, Inc.	465 Saratoga St	Cohoes	NY
Mohawk Paper Mills, Inc.	Chestnut Hill Rd	Waterford	NY
Norampac Industries Inc.	4001 Packard Rd	Niagara Falls	NY
Norbord Industries Inc.	Laurel Bank Av	Deposit	NY
Rexam DSI	Bridge St	Brownville	NY
Spaulding Composites Co.	310 Wheeler St	Tonawanda	NY

Company	Address	City	State
Visy Paper New York Inc.	4435 Victory Blvd	Staten Island	NY
Atlas Roofing Corp.	675 Oxford Rd	Franklin	OH
Bay West Paper Corp.	700 Columbia Av	Middletown	OH
Columbus Specialty Paper Products L.L.C.	785 Frebis Av	Columbus	OH
Fox River Paper Co.	700 W Court St	Urbana	OH
Greif Bros. Corp.	9420 Warmington St	Massillon	OH
International Paper Co.	400 Dayton St	Hamilton	OH
MeadWestvaco Paper	401 S Paint St	Chillicothe	OH
Newark Group	310 Water St	Baltimore	OH
Newark Group	50 E 6th St	Franklin	OH
Rittman Paperboard	100 Industrial Av	Rittman	OH
Smurfit-Stone Container Corp.	407 Charles St	Middletown	OH
Smurfit-Stone Container Corp.	500 N 4th St	Coshocton	OH
The Crystal Tissue Co.	3120 S Verity Pkwy	Middletown	OH
Georgia-Pacific Corp.	4901 Chandler Rd	Muskogee	OK
Kimberly-Clark Corp.	13252 S Yale Pl	Jenks	OK
Orchids Paper Products Co.	Rte 3, Box 69-8, 6th & Hunt Sts	Pryor	OK
American Tissue Mills of Oregon, Inc.	1300 Kaster Rd	Saint Helens	OR
Blue Heron Paper Co.	419 Main St	Oregon City	OR
Evanite Fiber Corp.	1185 SE Crystal Lake Dr	Corvallis	OR
Georgia-Pacific Corp.	92326 Taylorsville Rd, Rte 2, Box 2185	Clatskanie	OR
GS Roofing Products Co. Inc.	6350 NW Front Av	Portland	OR
Smurfit-Stone	PO B0x 70	Newberg	OR
Weyerhaeuser Co.	785 N 42nd St	Springfield	OR
Appleton Papers Inc.	100 Paper Mill Rd	Roaring Spring	PA
Brandywine Paperboard Mills, Inc.		Downingtown	PA
Cascades Tissue (Perkins)	Main St	Ransom	PA
P. H. Glatfelter Co.	228 S Main St	Spring Grove	PA
Reading Paperboard Corp.	3110 Paper Mill Rd, Rte. #5	Sinking Spring	PA
Rock-Tenn Co.	600 Brandywine Av	Downingtown	PA
Rock-Tenn Co.	Paper Mill Rd	Delaware Water Gap	PA
Smurfit-Stone Container Corp.	5000 Flat Rock Rd	Philadelphia	PA
Bowater Inc.	5300 Cureton Ferry Rd	Catawba	SC
International Paper Co.	700 S Kaminski	Georgetown	SC
International Paper Co.	4001 McCords Ferry Rd	Eastover	SC
Kimberly-Clark Corp.	1420 Sanddarfary Rd	Beech Island	SC
Sonoco Products Co.	1 N Second St	Hartsville	SC
Weyerhaeuser Co.		Bennettsville	SC
Bowater Newsprint	5020 Hwy 11 S	Calhoun	TN
Packaging Corp. of America	6715 Hwy 57	Counce	TN
Sonoco Products Co.	766 Industrial Rd	Newport	TN
Weyerhaeuser Co.	100 Clinchfield St	Kingsport	TN
Abitibi-Consolidated Inc.	18511 Beaumont Hwy	Sheldon	TX
Abitibi-Consolidated Inc.	Hwy 103 E	Lufkin	TX
Inland Paperboard & Packaging, Inc.	1750 Inland Rd	Orange	TX
International Paper Co.	Hwy 59 S, FM3129	Domino	TX
MeadWestvaco Corp.	P.O. Box 816	Evadale	TX
Bear Island Paper Co., L.L.C.	10026 Old Ridge Rd	Ashland	VA
Georgia-Pacific Corp.	9363 Lee Jackson Hwy	Big Island	VA

Company	Address	City	State
Georgia-Pacific Corp.	116 S Allen Rd	Jarratt	VA
International Paper Co.	34040 Union Camp Dr	Franklin	VA
MeadWestvaco Corp.	104 E Riverside St	Covington	VA
Smurfit-Stone Container Corp.	910 Industrial St	Hopewell	VA
Sonoco Products Co.	1850 Commerce Rd	Richmond	VA
American Paper Mills of Vermont Inc.	Riverside Av	Gilman	VT
FiberMark, Inc.	161 Wellington Rd	Brattleboro	VT
Boise Cascade Corp.	907 W 7th St	Vancouver	WA
Daishowa America Co., Ltd.	1902 Marine Dr	Port Angeles	WA
Georgia-Pacific Corp.	401 NE Adams St	Camas	WA
Georgia-Pacific West, Inc.	300 W Laurel St	Bellingham	WA
Grays Harbor Paper, L.P.	801 23rd St	Hoquiam	WA
Inland Empire Paper Co.	N 3320 Argonne Rd	Spokane	WA
Longview Fibre Co.	300 Fibre Way	Longview	WA
North Pacific Paper Corp.		Longview	WA
Ponderay Newsprint Co.	422767 State Hwy 20	Usk	WA
Port Townsend Paper Corp.	100 Paper Mill Hill Rd	Port Townsend	WA
Smurfit-Stone Container Corp.	817 E 27th St	Tacoma	WA
Sonoco Products Co.	Steele Av	Sumner	WA
Weyerhaeuser Co.	3401 Industrial Way	Longview	WA
Appleton Coated L.L.C.	540 Prospect St	Combined Locks	WI
Badger Paper Mills, Inc.	200 W Front St	Peshtigo	WI
CityForest Corp.	1215 East Worden Av	Ladysmith	WI
Domtar Industries, Inc.	100 Wisconsin River Dr	Port Edwards	WI
Geo. A. Whiting Paper Co.	100 River St	Menasha	WI
Georgia-Pacific Corp.	Hwy 13	Phillips	WI
Georgia-Pacific Corp.	500 Day St	Green Bay	WI
Gilbert Paper	430 Ahnaip St	Menasha	WI
International Paper Co.	200 Main Av	De Pere	WI
International Paper Co.	600 Thilmany Rd	Kaukauna	WI
Kerwin Paper Co.	801 S Lawe St	Appleton	WI
Kimberly-Clark Corp.	3243 Whiting Rd	Stevens Point	WI
Kimberly-Clark Corp.	3120 Riverside Av	Marinette	WI
Little Rapids Corp.	W 7575 Popular Rd	Shawano	WI
Neenah Paper	135 N Commercial St	Neenah	WI
Oconto Falls Tissue, Inc.	106 E Central Av	Oconto Falls	WI
SCA Tissue North America	PO Box 2400	Neenah	WI
Stora Enso North America Corp.		Stevens Point	WI
Stora Enso North America Corp.	2627 Whiting Rd	Stevens Point	WI
Stora Enso North America Corp.		Wisconsin Rapids	WI
Stora Enso North America Corp.	1101 Mill St	Niagara	WI
Stora Enso North America Corp.	433 N Main St	Kimberly	WI
Wausau-Mosinee Paper Corp.	100 Main St	Mosinee	WI
Wausau-Mosinee Paper Corp.	515 W Davenport St	Rhinelander	WI
Wausau-Mosinee Paper Corp.	One Quality Way	Brokaw	WI
Wisconsin Paperboard Corp.	1514 E Thomas Av	Milwaukee	WI
Halltown Paperboard Co.	Halltown Rd, Old Rte 340	Halltown	WV

Appendix 2
Workforce Management Practices

Mill HR Survey

Georgia Tech | DuPree College of Management

Center for Paper
Business and Industry
Studies

Conducted by

Charles Parsons
Georgia Institute of Technology

and

The Survey Research Center
University of Georgia
Athens, GA 30602

Your help is being sought for a study addressing how workforce management practices affect productivity and worker attitudes in the pulp and paper industry.   The study's objectives is to better understand how various combinations of work design and related Human Resource Management practices can be utilized to improve mill performance. By obtaining information from your mill, we seek to identify initiatives and patterns of introduction that can be enhance the contributions of the workforce.

The Mill HR Survey needs to be completed by the person who is most directly responsible for the HR function in the mill. Two other surveys, one for the production manager and one for a paper machine superintendent, are being mailed directly to those individuals. Upon completion, please return the survey in the self-addressed, stamped envelope.

* Your responses will be strictly confidential and aggregated with other respondent's data for analysis, and will be used for research purposes only.
* Answer questions as accurately as possible.
* Keep in mind that questions pertain to both practices in the mill and also specific machine teams.
* A report of the findings from this study will be available to all respondents through CPBIS.

If you have any questions, please contact:
        Dr. Charles K. Parsons
        DuPree College of Management
        Georgia Institute of Technology
        Charles.parsons@mgt.gatech.edu

Thank You in Advance for your Help.

.Section 1: The Workforce

In this mill, what is the current number of:

1. Permanent employees?   _____

2. Temporary employees?   _____

3. Salaried employees?   _____

4. Hourly employees?   _____

WORKFORCE COMPOSITION

5. What is the minimum level of formal education required by this mill in order to be a first line supervisor, shift team coordinator, or team leader? (Circle One)

> 1   Less than High School
> 2   High School
> 3   Some College
> 4   College Degree

6. What is the proportion of first level supervisors (or equivalent) in the mill that have some college education? (circle one)

    1. 0-20%   2. 21-40%   3. 41-60%   4. 61-80%   5. 81-100%

7. What is the proportion of first level supervisors (or equivalent) in the mill that were promoted from the rank and file? (circle one)

    1. 0-20%   2. 21-40%   3. 41-60%   4. 61-80%   5. 81-100%

8. What proportion of the hourly workforce is

> Black   _____%
> White   _____%
> Hispanic   _____%
> Other   _____%

2. What proportion of the hourly workforce is

> Male   _____%
> Female   _____%

2. What is the average total employment cost per production worker, including wage rate, benefits, bonus or incentive payments, and taxes?

_____ (US Dollars/Year)

What percentage of total labor cost for production workers is for

> 11. Base pay   _____%
> 12. Incentive pay   _____%
> 13. Benefits   _____%

SECTION 2: MILL ADMINISTRATIVE STRUCTURE

Is there a specific department or section (not a single person) responsible for:

		Yes	No

14.	Finance	1	2
15.	Personnel/Labor Relations/HR	1	2
16.	Accounting	1	2
17.	Community Relations	1	2
18.	Research and Development	1	2
19.	Marketing or Sales	1	2
20.	Maintenance	1	2
21.	Engineering	1	2
22.	Converting	1	2
23.	Pulping	1	2
24.	Chemical Production and Process	1	2

We are interested in who is responsible for making different kinds of decisions in your workplace. For the list of decision areas below, who actually makes the **final** decision in each area. Is it the Area or Production manager (or similar position), someone below that, or someone at a higher level?

		Area or Prod. Mgr.	Someone above	Someone below
25.	Scheduling/overtime	1	2	3
26.	Which employees to hire	1	2	3
27.	Promotions	1	2	3
28.	Use of subcontractors/temporaries	1	2	3
29.	Discharge/layoffs	1	2	3
30.	Wage/Salary layoffs	1	2	3
31.	Number of employees	1	2	3

SECTION 3. UNION-MANAGEMENT RELATIONS. IF PRODUCTION WORKERS ARE <u>NOT</u> UNIONIZED SKIP TO SECTION 4 TITLED "WORKER-MANAGEMENT CLIMATE"

UNION-MANAGEMENT COMMITTEES

Which levels of union-management committees exist in this mill?

	Yes	No
32. Shop floor	1	2
33. Mid-management	1	2
34. Senior leadership	1	2

Which of the following issues are expected to be covered by the union-management committees? (Check the right answer)

		Yes	No
35.	Selection and implementation of new technology	1	2
36.	Contracting, developing, and delivering worker training	1	2
37.	Reorganization of work	1	2
38.	Plant effectiveness (productivity and quality)	1	2
39.	Statistical process control	1	2
40.	Safety and health issues	1	2
41.	Transfer or sale of plant operations	1	2
42.	Holidays, breaks, fringes	1	2

GENERAL UNION-MANAGEMENT RELATIONS

Please circle the appropriate number (1 to 5) where 1 means you strongly disagree with the statement and 5 means that you strongly agree with the statement)

		Strongly Agree		Neither Agree or Disagree		Strongly Disagree
43.	grievances are settled promptly	1	2	3	4	5
44.	negotiations take place in good faith	1	2	3	4	5
45.	employee view the conditions of employment as fair	1	2	3	4	5
46.	union & management make sincere efforts to solve common problems	1	2	3	4	5
47.	management seeks input from the union before initiating changes	1	2	3	4	5
48.	union and management exchange information freely	1	2	3	4	5
49.	union is interested in cooperating with and supporting management	1	2	3	4	5
50.	union-management relations have history of past failures	1	2	3	4	5
51.	past battles between union and management have left serious scars	1	2	3	4	5
52.	the number of grievances seems reasonable for a mill of this size	1	2	3	4	5

53. How do you perceive your relationship with the union? (Check the answer that best applies).

1. Confrontational _____   2. Accommodating _____   3. Cooperative _____

[SKIP TO SECTION 5: MILL PERFORMANCE]

SECTION 4. WORKER-MANAGEMENT CLIMATE

For the following statements, indicate the degree to which you agree or disagree by circling a number 1 to 5.

		Strongly Agree	⟹	Neither Agree or Disagree	⟹	Strongly Disagree
54.	Workers' disagreements with management are settled promptly	1	2	3	4	5
55.	The hourly workforce trusts management on wage and hour issues	1	2	3	4	5
56.	Workers view the conditions of employment as fair	1	2	3	4	5
57.	Workers and management make sincere efforts to solve common problems	1	2	3	4	5
58.	Management seeks input from the general population before initiating changes	1	2	3	4	5
59.	Workers and management exchange information freely	1	2	3	4	5

SECTION 5: MILL PERFORMANCE

60. What is the percent of targeted production achieved in this mill over the past year?   _____

How would you compare the mill's performance over the past 3 years to that of other mills that produce similar grades or products? Please rate each category by circling a number.

		Worse	About the Same	Somewhat Better	Much Better
61.	Quality of products, services, or programs	1	2	3	4
62.	New products, services, or programs development	1	2	3	4
63.	Ability to attract essential employees	1	2	3	4
64.	Ability to retain essential employees	1	2	3	4
65.	Satisfaction of the customers	1	2	3	4
66.	Relations among employees in general	1	2	3	4
67.	Relations between management and other employees	1	2	3	4
68.	Marketing	1	2	3	4
69.	Growth in sales	1	2	3	4
70.	Profitability	1	2	3	4
71.	Market share	1	2	3	4
72.	Ability to provide products at low cost	1	2	3	4
73.	Ability to maintain a safe work environment	1	2	3	4

HR PRACTICES IN THE MILL

The next set of questions is presented as a 'grid' in which we want you to tell us about a set of workforce practices that may or may not have been adopted in this mill as a whole including all operating areas such as paper machines, maintenance, converting, etc. Use the glossary at the end of the survey for definition of terms. If you cannot determine the exact values, please give us your best guess. Please indicate 'DK' for don't know.

		Ever used (Yes or no)	If yes year began?	Practice still in effect? (Yes or no)	If yes, What % of workers Are involved	If yes, how effective has it been? 1=not at all 2=a little, 3=somewhat, 4=quite a bit 5=a great deal	If not in effect when did it end?
74.	Self-directed work teams						
75.	Employee problem-solving groups (or quality circles)						
76.	Job rotation						
77.	Total quality management/continuous quality improvement						
78.	Gain sharing compensation program						
79.	Employment security policy						
80.	Pay for skill program						
81.	Profit-sharing/bonus program						
82.	Removal of shift supervisors/ delayering						

SECTION 6: PRODUCTION AREA DESCRIPTIONS

Next, we would like you to consider a specific paper machine in your mill.

Machine # xxxxx

> 2. What year was this paper machine installed? _____

The first set of questions is presented as a 'grid' in which we want you to tell us about a set of workforce practices that may or may not have been adopted in this production area. Use the glossary at the end of the survey for definition of terms. If you cannot determine the exact values, please give us your best guess. Please indicate 'DK' for don't know.

		Ever used (Yes or no)	If yes year began?	Practice still in effect? (Yes or no)	If yes, What % of workers Are involved	If yes, how effective has it been? 1=not at all 2=a little, 3=somewhat, 4=quite a bit 5=a great deal	If not in effect when did it end?
84	Self-directed work teams						
85.	Employee problem-solving groups (including quality circles)						
86.	Job rotation						
87.	Total quality management/continuous quality improvement						
88.	Gain sharing compensation program						
89.	Employment security policy						
90.	Pay for skill program						
91.	Profit-sharing/bonus program						
92.	Removal of shift supervisors/ delayering						

93. Number of employees in this production area (including all shifts) _____

94. How many shifts are there in this production area?

      1   2   3   4

Over the past year, **about what percent** of non-supervisory employees in this production area were involved in each of the following activities or programs? Circle a % for each activity or program.

		0%	20%	40%	60%	80%	100%
95.	Training in technical job skills						
96.	Soft skills training(e.g. interpersonal skills)						
97.	Employee problem-solving groups (or quality circles)						
98.	Total quality						

	management/ continuous improvement						

PRODUCTION AREA PERFORMANCE

99. What is the frequency of grade changes on this paper machine? (Circle one).

      1. 0   2. 1-2   3. 3-5   4. 6-8   5. 9 or more {per week}

100. What is the percent of targeted production achieved over the past year in this operating area?   _____

101. Over the past year, what is the number of months that you have met or exceeded targeted production?   _____

102. What is the percent of scheduled machine 'uptime' achieved over the past year in this operating area? _____

103. Over the past year, what is the number of months that you have met or exceeded this percentage of uptime?   _____

Next, we would like you to consider a second paper machine in your mill. If you only have one paper machine, please skip to Section 7 of the survey.

Machine # xxxxx

104. What year was this paper machine installed? _____

The first set of questions is presented as a 'grid' in which we want you to tell us about a set of workforce practices that may or may not have been adopted in this production area. Use the glossary at the end of the survey for definition of terms. If you cannot determine the exact values, please give us your best guess. Please indicate 'DK' for don't know.

		Ever used (Yes or no)	If yes year began?	Practice still in effect? (Yes or no)	If yes, What % of workers Are involved	If yes, how effective has it been? 1=not at all 2=a little, 3=somewhat, 4=quite a bit 5=a great deal	If not in effect when did it end?
105.	Self-directed work teams						
106.	Employee problem-solving groups (including quality circles)						
107.	Job rotation						
108.	Total quality management/continuous quality improvement						
109.	Gain sharing compensation program						
110.	Employment security policy						
111.	Pay for skill program						
112.	Profit-sharing/bonus program						
113.	Removal of shift supervisors/ delayering						

114. Number of employees in this production area (including all shifts) _____

115. How many shifts are there in this production area?

        1   2   3   4

Over the past year, **about what percent** of non-supervisory employees in this production area were involved in each of the following activities or programs? Circle a % for each activity or program.

		0%	20%	40%	60%	80%	100%
116.	Training in technical job skills						
117.	Soft skills training(e.g. interpersonal skills)						
118.	employee problem-solving						

	groups (or quality circles)						
119.	total quality management/ continuous improvement						

PRODUCTION AREA PERFORMANCE

120. What is the frequency of grade changes on this paper machine? Circle one.

      1. 0   2. 1-2   3. 3-5   4. 6-8   5. 9 or more {per week}

121. What is the percent of production targets achieved over the past year in this operating area?
      _____

122. Over the past year, what is the number of months that you have met or exceeded this percentage?
      _____

123. What is the percent of scheduled machine 'uptime' achieved over the past year in this operating area?
      _____

124. Over the past year, what is the number of months that you have met or exceeded this percentage of uptime?
      _____

125. Other than this paper machine area (s) described above, how much workforce practice innovation has there been in other production
areas of the mill?

    1 = almost none   2= a little   3= some   4= quite a bit   5 = a great deal

SECTION 7: HR SYSTEM 'PARTICIPATION

How much participation have each of the following individuals or groups had on the initiation of non-traditional workforce practices in your mill?

		Very Little		⟹		A great deal
126.	Corporate management	1	2	3	4	5
127.	Mill business management	1	2	3	4	5
128.	Mill operations managers	1	2	3	4	5
129.	Mill human resource management	1	2	3	4	5
130.	Non-supervisory employees	1	2	3	4	5

Thank you very much for taking the time to complete this survey

Workforce Management Practices
Production/Operations Manager Survey

Georgia Tech | Du of | **Center for Paper Business and Industry Studies**

Your help is being sought for a study addressing how workforce management practices affect productivity and worker attitudes in the pulp and paper industry.   The study's objective is to better understand how various combinations of work design and related Human Resource Management practices can be utilized to improve mill performance. By obtaining information from your mill, we seek to identify initiatives and patterns of introduction that can be enhance the contributions of the workforce.

The Production/Operations Manager Survey needs to be completed by the person who is most directly responsible for the overall production function in the mill. Two other surveys, one for the HR manager and one for a paper machine superintendent, are being mailed directly to those individuals. Upon completion, please return the survey in the self-addressed, stamped envelope.

* Your responses will be strictly confidential and aggregated with other respondent's data for analysis, and will be used for research purposes only.
* Answer questions as accurately as possible.
* Keep in mind that questions pertain to both practices in the mill and also specific machine teams.
* A report of the findings from this study will be available to all respondents through CPBIS.

If you have any questions, please contact:
        Dr. Charles K. Parsons
        DuPree College of Management
        Georgia Institute of Technology
        Charles.parsons@mgt.gatech.edu

Thank You in Advance for your Help.

INSTRUCTIONS

In this survey you will be asked a series of questions about how your mill's operation and how the workforce is managed. Your answers to this survey will be held in the strictest confidence. No one else besides the researchers will see your survey responses.

MILL OVERVIEW

1. In what year was your mill first established?   _____

2. How many distinct operating areas are there in your mill?   _____

3. Is this a single product mill?   Yes   No

4. Please indicate the name of the company that owned this mill for each of the following years (use ditto marks " where appropriate).

1991 _____	1994 _____	1997 _____	2000 _____
1992 _____	1995 _____	1998 _____	2001 _____
1993 _____	1996 _____	1999 _____	2002 _____

BUSINESS STRATEGY

How important are each of the following goals to the ability of this mill to compete effectively? (1 = unimportant, 6 = very important). Circle the appropriate number for each question.

		Unimportant					Very Important
5.	Provide customers with basic pulp or paper products at prices below those of competitors.	1	2	3	4	5	6
6.	Provide customers with specialized sizes, types, or grades of pulp or paper products.	1	2	3	4	5	6
7.	Develop and produce new styles, sizes, and or grades to respond to fluctuation in market demand	1	2	3	4	5	6
8.	Produce styles, sizes, and grades for the higher-end segments of the pulp and paper market.	1	2	3	4	5	6
9.	Develop new techniques and methods to market products	1	2	3	4	5	6
10.	Serve the needs of customers within a specific geographic area	1	2	3	4	5	6
11.	Create recognition of the mill's name and reputation in the industry	1	2	3	4	5	6
12.	Meet predetermined profit goals	1	2	3	4	5	6
13.	Meet predetermined cost goals	1	2	3	4	5	6
14.	Serve customers who demand large batches of product with minimum variation in product quality	1	2	3	4	5	6

SECTION 2. MILL ADMINISTRATIVE STRUCTURE

We are interested in who typically is responsible for making different kinds of decisions in your workplace. For the list of decision areas below who actually makes the **final** decision. Is it you, the Production manager (or similar position), someone below you, or someone at a higher level?

		Area or Production Manager (or equivalent)	Someone Below	Someone Above
15.	Scheduling/overtime	1	2	3
16.	Which employees to hire	1	2	3
17.	Promotions	1	2	3

18.	Use of subcontractors/temporaries	1	2	3
19.	Discharge/layoffs	1	2	3
20.	Wage/Salary levels	1	2	3
21.	Number of employees	1	2	3

MILL INFORMATION SYSTEM

22. We are interested in the extent of the computer information systems that are used in mill. Please indicate which is most characteristic of your mill (circle a, b, c, or d):

      a. no computerized information system

      b. process control information systems for individual paper machines (or other equipment)

      c. information systems that integrate multiple production units, such as paper machines, pulping, and power plant

      d. information systems that integrate broader mill functions such as shipping, customer tracking and so on.

SECTION 3: MILL PERFORMANCE

2. What is the percent of targeted production achieved in this mill over the past year?

%

How would you compare the mill's performance over the past 3 years to that of other mills that produce similar grades or products? Please rate each category.

		Worse	About the Same	Somewhat Better	Much Better
24.	Quality of products, services, or programs	1	2	3	4
25.	Development of new products, services, or programs	1	2	3	4
26.	Ability to attract essential employees	1	2	3	4
27.	Ability to retain essential employees	1	2	3	4
28.	Satisfaction of the customers	1	2	3	4
29.	Relations among employees in general	1	2	3	4
30.	Relations between management and other employees	1	2	3	4
31.	Marketing	1	2	3	4
32.	Growth in sales	1	2	3	4
33.	Profitability	1	2	3	4
34.	Market share	1	2	3	4
35.	Ability to provide products at low cost	1	2	3	4
36.	Ability to maintain a safe work environment	1	2	3	4

SECTION 4: UNION- MANAGEMENT RELATIONS

If Production Workers are not unionized skip to Section 5 titled "Worker-Management Climate"
Please indicate how strongly you agree or disagree with each of the following statements concerning relations between the union and management in this mill. Circle a number for each statement.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
37.	Grievances are settled promptly	1	2	3	4	5
38.	Negotiations take place in good faith	1	2	3	4	5

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
39.	Employees view the conditions of employment as fair	1	2	3	4	5
40.	Union and management make sincere efforts to solve common problems	1	2	3	4	5
41.	Management seeks input from the union before initiating changes	1	2	3	4	5
42.	Union and management exchange information freely	1	2	3	4	5
43.	Union is interested in cooperating with and supporting management	1	2	3	4	5
44.	Union-management relations have a history of past failures	1	2	3	4	5
45.	Past battles between union and management have left serious scars.	1	2	3	4	5

46 Overall, how do you perceive management's relationship with the union? (circle one that best applies)

a. Confrontational   b. Accommodating   c. Cooperative

[Skip to Section 6: Operating Area Description]

SECTION 5: WORKER-MANAGEMENT CLIMATE

Please indicate how strongly you agree or disagree with each of the following statements concerning relations between the union and management in this mill. Circle a number for each statement.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
47.	Worker disagreements with management are settled promptly	1	2	3	4	5
48.	The hourly workforce trusts management on wage and hour issues	1	2	3	4	5
49.	Employees view the conditions of employment as fair	1	2	3	4	5
50.	Workers and management make sincere efforts to solve common problems	1	2	3	4	5
51.	Management seeks input from the workforce before initiating changes	1	2	3	4	5
52.	Workers and management exchange information freely	1	2	3	4	5

SECTION 6: OPERATING AREA DESCRIPTIONS

Next, we would like you to consider a specific paper machine in your mill**.**

Machine # xxxxx

53. What year was this paper machine installed? _____

The first set of questions is presented as a 'grid' in which we want you to tell us about a set of workforce practices that may or may not have been adopted in this production area. Use the glossary at the end of the survey for definition of terms. If you cannot determine the exact values, please give us your best guess. Please indicate 'DK' for don't know.

		Ever used? (Yes or No)	If Yes – Year Began?	Practice Still in Effect? (Yes or No)	If Yes – How Effective has it been? 1 = not at all; 2 = a little; 3 = somewhat; 4 = quite a bit; 5 = a great deal	If not in Effect, when did it end?
54.	Self-directed work teams					
55.	Employee problem-solving groups (including quality circles)					
56.	Job rotation					

57.	Total quality management/continuous quality improvement					
58.	Gain sharing compensation program					
59.	Employment security policy					
60.	Pay for skill program					
61.	Profit-sharing/bonus program					
62.	Removal of shift supervisors/ delayering					

63. Number of employees in this production area (including all shifts)   _____

64. How many shifts are there in this production area?   1   2   3   4

Over the past year, **about what percent** of non-supervisory employees in this production area were involved in each of the following activities or programs? Circle a % for each activity or program.

65.	Training in technical job skills	0%	20%	40%	60%	80%	100%
66.	Soft skills training(e.g. interpersonal skills)	0%	20%	40%	60%	80%	100%
67.	employee problem-solving groups (or quality circles)	0%	20%	40%	60%	80%	100%
68.	total quality management/ continuous improvement	0%	20%	40%	60%	80%	100%

PRODUCTION AREA PERFORMANCE

69. What is the frequency of grade changes on this paper machine? Circle one.
       0   1-2   3-5   6-8   9 or more   {per week}

70. What is the percent of production targets achieved over the past year in this operating area?   _____

71. Over the past year, what is the number of months that you have met or exceeded this percentage?   _____

72. What is the percent of scheduled machine 'uptime' achieved over the past year in this operating area?   _____

73. Over the past year, what is the number of months that you have met or exceeded this percentage of uptime? _____

74. Other than this paper machine area (s) describe above, how much workforce practice innovation has there been in other production areas of the mill?

       1 = almost none   2= a little   3= some   4= quite a bit   5 = a great deal

PAPER MACHINE AUTOMATION

We have a few questions about technology and process control in on the paper machine listed above. Circle Yes or No and fill in blank.

2. First, does this machine used Distributed Control Systems (DCS) – that is, computerized process control systems with operators monitoring the production process using computer terminals?

       No   **Yes**

       If no, go to question 77.   If yes, when was DCS first introduced?
                                                        _____

2. Has the DCS software been substantially upgraded since it was first installed

       No   **Yes**

       If no, go to question 77.   If yes: when was DCS last upgraded?
                                                        _____

2. Is this machine capable of doing automatic grade changes (with machine specifications automatically set once the
product grade is chosen)?

No   **Yes**

78. Does this paper machine use sensors at the dry end, to measure things like tensile (strength), smoothness,
and caliper of the paper as it is being produced?

No   **Yes**

If no, go on to question 80.   If yes, when were the sensors first installed?
_____

2. If sensors used, have the they been substantially upgraded since they were first installed?

No   **Yes**

If no, go to question 80.   If yes: when were they last upgraded?   _____

2. Finally, do the operators on this machine have access to a mill-wide information system such as Pi, which allows them to track changes in the production process in the past or in other parts of the mill?

No   **Yes**

Next, we would like you to consider a second paper machine in your mill. If you only have one paper machine, please skip to Section 7 of the survey.

Machine # xxxxx

81. What year was this paper machine installed? _____

The first set of questions is presented as a 'grid' in which we want you to tell us about a set of workforce practices that may or may not have been adopted in this production area. Use the glossary at the end of the survey for definition of terms. If you cannot determine the exact values, please give us your best guess. Please indicate 'DK' for don't know.

		Ever Used (Yes or No)	If Yes –Year Began?	Practice Still in effect? (Yes or No)	If Yes – How effective has it been? 1 = Not at all; 2 = a little, 3 = somewhat; 4 = quite a bit; 5 = a great deal	If Not in effect – When did it End?
82.	Self-directed work teams					
83.	Employee problem-solving groups (including quality circles)					
84.	Job rotation					
85.	Total quality management/continuous quality improvement					
86.	Gain sharing compensation program					
87.	Employment security policy					
88.	Pay for skill program					
89.	Profit-sharing/bonus program					
90.	Removal of shift supervisors/ delayering					

91. Number of employees in this production area (including all shifts) _____

92. How many shifts are there in this production area?   1   2   3   4

Over the past year, **about what percent** of non-supervisory employees in this production area were involved in each of the following activities or programs? Circle a % for each activity or program.

93.	Training in technical job skills	0%	20%	40%	60%	80%	100%
94.	Soft skills training(e.g. interpersonal skills)	0%	20%	40%	60%	80%	100%
95.	employee problem-solving groups (or quality circles)	0%	20%	40%	60%	80%	100%
96.	total quality management/ continuous improvement	0%	20%	40%	60%	80%	100%

PRODUCTION AREA PERFORMANCE

97. What is the frequency of grade changes on this paper machine? Circle one.

     0   1-2   3-5   6-8   9 or more   {per week}

98. What is the percent of production targets achieved over the past year in this operating are? _____

99. Over the past year, what is the number of months that you have met or exceeded this percentage? _____

100. What is the percent of scheduled machine 'uptime' achieved over the past year in this operating area?

_____

101. Over the past year, what is the number of months that you have met or exceeded this percentage of uptime? _____

102. Other than this paper machine area (s) described above, how much workforce practice innovation has there been in other production areas of the mill?

          1 = almost none   2= a little   3= some   4= quite a bit   5 = a great deal

PAPER MACHINE AUTOMATION

We have a few questions about technology and process control in on the paper machine listed above. Circle Yes or No and fill in blank.

2. First, does this machine used Distributed Control Systems (DCS) – that is, computerized process control systems with operators monitoring the production process using computer terminals?

    No   **Yes**

If no, go to question 105.   If yes, when was DCS first introduced? _____

2. Has the DCS software been substantially upgraded since it was first installed

    No   **Yes**

If no, go to question 105.   If yes: when was DCS last upgraded? _____

2. Is this machine capable of doing automatic grade changes (with machine specifications automatically set once the
product grade is chosen)?

    No   **Yes**

2. Does this paper machine use sensors at the dry end, to measure things like tensile (strength), smoothness,
and caliper of the paper as it is being produced?

    No   **Yes**

If no, go on to question 108.   If yes, when were the sensors first installed? _____

2. If sensors used, have the they been substantially upgraded since they were first installed?
    No   **Yes**

If no, go to question 108.   If yes: when were they last upgraded?   _____

2. Finally, do the operators on this machine have access to a mill-wide information system such as Pi, which allows them to track changes in the production process in the past or in other parts of the mill?

    No   **Yes**

SECTION 7: HR SYSTEM PARTICIPATION

How much participation do each of the following individuals or groups have on the initiation of any work system innovations in your mill?

How much participation have each of the following individuals or groups had on the initiation of non-traditional workforce practices in your mill?	Very Little			A great deal	
109. Corporate management	1	2	3	4	5
110. Mill business management	1	2	3	4	5
111. Mill operations managers	1	2	3	4	5
112. Mill human resource management	1	2	3	4	5
113. Non-supervisory employees	1	2	3	4	5

2. What is your total approximate annual operating budget in this mill (including labor, raw materials, maintenance, other production costs?

Thank you very much for your time.

Workforce Management Practices
Machine Superintendent Survey

Georgia Tech | Du of | **Center for Paper Business and Industry Studies**

Your help is being sought for a study addressing how workforce management practices affect productivity and worker attitudes in the pulp and paper industry.   The study's objectives is to better understand how various combinations of work design and related Human Resource Management practices can be utilized to improve mill performance. By obtaining information from your mill, we seek to identify initiatives and patterns of introduction that can be enhance the contributions of the workforce.

The Machine Superintendent Survey needs to be completed by the person who is most directly responsible for the operation of paper machines in the mill. Two other surveys, one for the production manager and one for the HR manager, are being mailed directly to those individuals. Upon completion, please return the survey in the self-addressed, stamped envelope.

* Your responses will be strictly confidential and aggregated with other respondent's data for analysis, and will be used for research purposes only.
* Answer questions as accurately as possible.
* Keep in mind that questions pertain to both practices in the mill and also specific machine teams.
* A report of the findings from this study will be available to all respondents through CPBIS.

If you have any questions, please contact:
> Dr. Charles K. Parsons
> DuPree College of Management
> Georgia Institute of Technology
> Charles.parsons@mgt.gatech.edu

Thank You in Advance for your Help.

SECTION 1: OPERATING AREA DESCRIPTIONS

First, we would like you to consider a specific paper machine in your mill**.**

Machine # xxxxx

1. What year was this paper machine installed? _____

The first set of questions is presented as a 'grid' in which we want you to tell us about a set of workforce practices that may or may not have been adopted in this production area. Use the glossary at the end of the survey for definition of terms. If you cannot determine the exact values, please give us your best guess. Please indicate 'DK' for don't know.

		Ever used? (Yes or No)	If Yes – Year Began?	Practice Still in Effect? (Yes or No)	If Yes – How Effective has it been? 1 = not at all; 2 = a little; 3 = somewhat; 4 = quite a bit; 5 = a great deal	If not in Effect, when did it end?
2.	Self-directed work teams					
3.	Employee problem-solving groups (including quality circles)					
4.	Job rotation					
5.	Total quality management/continuous quality improvement					
6.	Gain sharing compensation program					
7.	Employment security policy					
8.	Pay for skill program					
9.	Profit-sharing/bonus program					
10.	Removal of shift supervisors/ delayering					

11. Number of employees in this production area (including all shifts)   _____

12. How many shifts are there in this production area?   1   2   3   4

Over the past year, **about what percent** of non-supervisory employees in this production area were involved in each of the following activities or programs? Circle a % for each activity or program.

13.	Training in technical job skills	0%	20%	40%	60%	80%	100%
14.	Soft skills training(e.g. interpersonal skills)	0%	20%	40%	60%	80%	100%
15.	employee problem-solving groups (or quality circles)	0%	20%	40%	60%	80%	100%
16.	total quality management/ continuous improvement	0%	20%	40%	60%	80%	100%

PRODUCTION AREA PERFORMANCE

17. What is the frequency of grade changes on this paper machine? Circle one.
          0   1-2   3-5   6-8   9 or more   {per week}

18. What is the percent of production targets achieved over the past year in this operating area?   _____

19. Over the past year, what is the number of months that you have met or exceeded this percentage?   _____

20. What is the percent of scheduled machine 'uptime' achieved over the past year in this operating area? _____

21. Over the past year, what is the number of months that you have met or exceeded this percentage of uptime? _____

22. Other than this paper machine area (s) describe above, how much workforce practice innovation has there been in other production areas of the mill?

       1 = almost none   2= a little   3= some   4= quite a bit   5 = a great deal

PAPER MACHINE AUTOMATION

We have a few questions about technology and process control in on the paper machine listed above. Circle Yes or No and fill in the blank where appropriate.

2. First, does this machine used Distributed Control Systems (DCS) – that is, computerized process control systems with operators monitoring the production process using computer terminals?

           No   **Yes**

If no, go to question 25.   If yes, when was DCS first introduced? _____

2. Has the DCS software been substantially upgraded since it was first installed

           No   **Yes**

If no, go to question 25.   If yes: when was DCS last upgraded? _____

2. Is this machine capable of doing automatic grade changes (with machine specifications automatically set once the
product grade is chosen)?

           No   **Yes**

26. Does this paper machine use sensors at the dry end, to measure things like tensile (strength), smoothness,
and caliper of the paper as it is being produced?

           No   **Yes**

If no, go on to question 28.   If yes, when were the sensors first installed? _____

2. If sensors used, have the they been substantially upgraded since they were first installed?

           No   **Yes**

If no, go to question 28.   If yes: when were they last upgraded?   _____

2. Finally, do the operators on this machine have access to a mill-wide information system such as Pi, which allows them to track changes in the production process in the past or in other parts of the mill?

           No   **Yes**

Next, we would like you to consider a second paper machine in your mill. If you only have one paper machine, please skip to Section 2 of the survey.

Machine # xxxxx

29. What year was this paper machine installed? _____

The first set of questions is presented as a 'grid' in which we want you to tell us about a set of workforce practices that may or may not have been adopted in this production area. Use the glossary at the end of the survey for definition of terms. If you cannot determine the exact values, please give us your best guess. Please indicate 'DK' for don't know.

		Ever Used (Yes or No)	If Yes –Year Began?	Practice Still in effect? (Yes or No)	If Yes – How effective has it been? 1 = Not at all; 2 = a little, 3 = somewhat; 4 = quite a bit; 5 = a great deal	If Not in effect – When did it End?
30.	Self-directed work teams					
31.	Employee problem-solving groups (including quality circles)					
32.	Job rotation					
33.	Total quality management/continuous quality improvement					
34.	Gain sharing compensation program					
35.	Employment security policy					
36.	Pay for skill program					
37.	Profit-sharing/bonus program					
38.	Removal of shift supervisors/ delayering					

39. Number of employees in this production area (including all shifts)   _____

40. How many shifts are there in this production area?   1   2   3   4

Over the past year, **about what percent** of non-supervisory employees in this production area were involved in each of the following activities or programs? Circle a % for each activity or program.

41.	Training in technical job skills	0%	20%	40%	60%	80%	100%
42.	Soft skills training(e.g. interpersonal skills)	0%	20%	40%	60%	80%	100%
43.	employee problem-solving groups (or quality circles)	0%	20%	40%	60%	80%	100%
44.	total quality management/ continuous improvement	0%	20%	40%	60%	80%	100%

PRODUCTION AREA PERFORMANCE

45. What is the frequency of grade changes on this paper machine? Circle one.

        0   1-2   3-5   6-8   9 or more   {per week}

46. What is the percent of production targets achieved over the past year in this operating are?   _____

47. Over the past year, what is the number of months that you have met or exceeded this percentage?   _____

48. What is the percent of scheduled machine 'uptime' achieved over the past year in this operating area?   _____

49. Over the past year, what is the number of months that you have met or exceeded this percentage of uptime?   _____

50.   Other than this paper machine area (s) described above, how much workforce practice innovation has there been in other production areas of the mill?

        1 = almost none   2= a little   3= some   4= quite a bit   5 = a great deal

PAPER MACHINE AUTOMATION

We have a few questions about technology and process control in on the paper machine listed above.
Circle Yes or No and fill in blank.

2. First, does this machine used Distributed Control Systems (DCS) – that is, computerized process control systems with operators monitoring the production process using computer terminals?

No   **Yes**

If no, go to question 53.   If yes, when was DCS first introduced?
                                             _____

2. Has the DCS software been substantially upgraded since it was first installed

No   **Yes**

If no, go to question 53.   If yes: when was DCS last upgraded?
                                             _____

2. Is this machine capable of doing automatic grade changes (with machine specifications automatically set once the
product grade is chosen)?

No   **Yes**

2. Does this paper machine use sensors at the dry end, to measure things like tensile (strength), smoothness,
and caliper of the paper as it is being produced?

No   **Yes**

If no, go on to question 56.   If yes, when were the sensors first installed?
_____

2. If sensors used, have the they been substantially upgraded since they were first installed?
No   **Yes**

If no, go to question 56.   If yes: when were they last upgraded?   _____

2. Finally, do the operators on this machine have access to a mill-wide information system such as Pi, which allows them to track changes in the production process in the past or in other parts of the mill?

No   **Yes**

SECTION 2: UNION- MANAGEMENT RELATIONS

If Production Workers are <u>not</u> unionized skip to Section 3 titled "Worker-Management Climate"
Please indicate how strongly you agree or disagree with each of the following statements concerning relations between the union and management in this mill. Circle a number for each statement.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
57.	Grievances are settled promptly	1	2	3	4	5
58.	Negotiations take place in good faith	1	2	3	4	5
59.	Employees view the conditions of employment as fair	1	2	3	4	5
60.	Union and management make sincere efforts to solve common problems	1	2	3	4	5
61.	Management seeks input from the union before initiating changes	1	2	3	4	5
62.	Union and management exchange information freely	1	2	3	4	5
63.	Union is interested in cooperating with and supporting management	1	2	3	4	5
64.	Union-management relations have a history of past failures	1	2	3	4	5
65.	Past battles between union and management have left serious scars.	1	2	3	4	5

66 Overall, how do you perceive management's relationship with the union? (circle one that best applies)

a. Confrontational b. Accommodating c. Cooperative

[Skip to Section 4: HR System Paticipation]

SECTION 3: WORKER-MANAGEMENT CLIMATE

Please indicate how strongly you agree or disagree with each of the following statements concerning relations between the union and management in this mill. Circle a number for each statement.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
67.	Worker disagreements with management are settled promptly	1	2	3	4	5
68.	The hourly workforce trusts management on wage and hour issues	1	2	3	4	5
69.	Employees view the conditions of employment as fair	1	2	3	4	5
70.	Workers and management make sincere efforts to solve common problems	1	2	3	4	5
71.	Management seeks input from the workforce before initiating changes	1	2	3	4	5
72.	Workers and management exchange information freely	1	2	3	4	5

Section 4: HR System Participation

How much participation do each of the following individuals or groups have on the initiation of any work system innovations in your mill?

How much participation have each of the following individuals or groups had on the initiation of non-traditional workforce practices in your mill?

	Very Little			**A great deal**	
73. Corporate management	1	2	3	4	5
74. Mill business management	1	2	3	4	5
75. Mill operations managers	1	2	3	4	5
76. Mill human resource management	1	2	3	4	5
77. Non-supervisory employees	1	2	3	4	5

Thank you very much for your time

DRAFT
Labor Union Leader Survey

Georgia Tech **Center for Paper Business and Industry Studies**

Conducted by

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and

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WE THANK YOU FOR TAKING THE TIME TO COMPLETE THIS SURVEY FOR US. IT WILL INCLUDE QUESTIONS CONCERNING THE MILL, THE WORKERS, THEIR JOBS, THE UNION, AND VARIOUS HUMAN RESOURCE PRACTICES. THIS MILL WAS SELECTED AS PART OF A REPRESENTATIVE SAMPLE OF ALL PULP AND PAPER MILLS IN THE UNITED STATES. *YOUR INDIVIDUAL RESPONSES WILL BE CONFIDENTIAL AND NOT SHARED WITH ANYONE OUTSIDE THE RESEARCH TEAM*. THE DATA FROM THIS SURVEY WILL BE COMBINED WITH DATA FROM MANY OTHER PAPER MILL UNIONS ACROSS THE COUNTRY. THE PRODUCTION MANAGER, THE HUMAN RESOURCE MANAGER, AND A SUPERINTENDENT HAVE ALSO BEEN ASKED TO COMPLETE SURVEYS. *ALL* EXTERNAL REPORTING BASED ON THESE DATA *WILL NOT* IDENTIFY SPECIFIC MILLS UNIONS, OR SURVEY RESPONDENTS. IN ORDER TO MAKE THE FINDINGS AS MEANINGFUL AS POSSIBLE, WE NEED YOU TO COMPLETE THE SURVEY INDEPENDENTLY AND MAIL IT DIRECTLY BACK TO THE SURVEY CENTER.

The brochure that was included in this mailing to you includes more information about the Workplace Transformation Project.

Section 1: Production Area Descriptions

In this first section, we would like you to consider a specific paper machine in your mill**.**

Machine # xxxxx

The first set of questions is presented as a 'grid' in which we want you to tell us about a set of workforce practices that may or may not have been adopted in this production area. Use the glossary at the end of the survey for definition of terms. If you cannot determine the exact values, please give us your best guess. Please indicate 'DK' for don't know.

		Ever used (Yes or no)	If yes, Year began	Practice still in effect? (Yes or No)	If yes- How effective has it been? 1= Not at all 2= a little 3=somewhat 4=quite a bit 5=a great deal	If Not in effect – When did it end?
1	Self-directed work teams					
2.	Employee problem-solving groups (including quality circles)					
3	Job rotation					
4	Total quality management/continuous quality improvement					
5	Gain sharing compensation program					
6	Employment security policy					
7	Pay for skill program					
8	Profit-sharing/bonus program					
9	Removal of shift supervisors/ delayering					

10. Number of employees in this production area (including all shifts)?   _____

11. How many shifts are there in this production area?   1   2   3   4

Over the past year, **about what percent** of non-supervisory employees in this production area were involved in each of the following activities or programs?

12	Training in technical job skills	0%	20%	40%	60%	80%	100%
13	Soft skills training (e.g. interpersonal skills)	0%	20%	40%	60%	80%	100%
14	Employee problem-solving groups (or quality circles)	0%	20%	40%	60%	80%	100%
15	Total quality management/continuous improvement committees	0%	20%	40%	60%	80%	100%

16. Other than this paper machine area described above, how much workforce practice innovation has there been in other production areas of the mill?

1	2	3	4	5
Almost none	A little	Some	Quite a bit	A great deal

Next, we would like you to consider a second paper machine in your mill. **If you only have one paper machine, please skip to Section 2 of the survey.**

Machine # xxxxx

The first set of questions is presented as a 'grid' in which we want you to tell us about a set of workforce practices that may or may not have been adopted in this production area. Use the glossary at the end of the survey for definition of terms. If you cannot determine the exact values, please give us your best guess. Please indicate 'DK' for don't know.

		Ever used (Yes or no)	If yes, Year began	Practice still in effect? (Yes or No)	If yes- How effective has it been? 1= Not at all 2= a little 3=somewhat 4=quite a bit 5=a great deal	If Not in effect – When did it end?
17	Self-directed work teams					
18.	Employee problem-solving groups (including quality circles)					
19	Job rotation					
20	Total quality management/continuous quality improvement					
21	Gain sharing compensation program					
22	Employment security policy					
23	Pay for skill program					
24	Profit-sharing/bonus program					
25	Removal of shift supervisors/ delayering					

26. Number of employees in this production area (including all shifts)? _____

27. How many shifts are there in this production area?   1   2   3   4

Over the past year, **about what percent** of non-supervisory employees in this production area were involved in each of the following activities or programs?

28	Training in technical job skills	0%	20%	40%	60%	80%	100%
29	Soft skills training (e.g. interpersonal skills)	0%	20%	40%	60%	80%	100%
30	Employee problem-solving groups (or quality circles)	0%	20%	40%	60%	80%	100%
31	Total quality management/continuous improvement committees	0%	20%	40%	60%	80%	100%

Section 2: Union Structure

32. What is the local union number and what national or international union does it belong to? _____

_____   _____

_____

33. When was this local union first established in this mill?   _____

34. How many workers (both members and non-members) are in the bargaining unit?   _____

Please circle the number that best represents your level of agreement or disagreement with each of the following statements.

	This local union:	Strongly Disagree	Disagree	Neither Agree or Disagree	*Agree*	Strongly Agree
35.	Receives training from the international union regarding joint union-management programs.	1	2	3	4	5
36.	Regularly seeks information from the international union.	1	2	3	4	5
37.	Has regular contact with other local unions.	1	2	3	4	5
38.	Has regular contact with industry-specific associations	1	2	3	4	5
39.	Has high levelsof member participation regarding in-plant activities.	1	2	3	4	5
40.	Has a strong network of shop floor representatives	1	2	3	4	5
41.	Has good two-way communication channels on the shop floor	1	2	3	4	5

42**.** Roughly, **about what percent** of members feel strongly about partnering efforts.

1	2	3	4	5
20% or less	21-40%	41-60%	61-80%	81-100%

Section 3. Union-Management Issues
Do you agree or disagree with the following statements? (Please circle the appropriate number where 1 means you strongly disagree with the statement and 5 means that you strongly agree with the statement)

		Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
43.	Grievances are settled promptly	1	2	3	4	5
44.	Negotiations take place in good faith	1	2	3	4	5
45.	Employees view the conditions of employment as fair	1	2	3	4	5

46.	Union and management make sincere efforts to solve common problems	1	2	3	4	5
47.	Management seeks input from the union before initiating changes	1	2	3	4	5
48.	Union and management exchange information freely	1	2	3	4	5
49.	Union and management cooperate and support each other	1	2	3	4	5
50.	Union-management relations have led to better understanding for all parties.	1	2	3	4	5
51.	There is a history of mistrust between union and management.	1	2	3	4	5
52.	The number of grievances seems reasonable for a mill of this size.	1	2	3	4	5

53. How do you perceive the local union's relationship with management? (Circle the answer that best applies).
1. Confrontational   2. Accommodating   3. Cooperative

If you have quality improvement teams or joint management-union committees in this mill, please answer the following questions. If you do not have quality improvement teams or joint management-union committees in this mill, skip to t **Section 4: Mill Performance**.

Which levels of union-management committees exist in this mill? (Check circle Y or N for each level)

                              Yes   No

54.	Shop floor	Y	N
55.	Mid-management	Y	N
56.	Senior leadership	Y	N

57. What is the approximate percent of the quality improvement teams or joint management-union committees that are made up of hourly workers?
_____

58. Are these workers usually union members, or not?

___ Yes
___ No

59. What is the level of influence that union members have on the decisions made in quality improvement teams or joint-management committees? (circle one)

1 = none   2 = a little   3 = some   4= quite a bit   5 = a great deal

Section 4: Mill Performance
In your opinion, how would you compare this mill in the past 3 years to that of other mills that produce similar grades or products? Please rate each category.

		Somewhat Worse	About the Same	Better	Much Better
60.	Worker wage levels	1	2	3	4
61	Worker Skill improvement	1	2	3	4
62	Worker job security	1	2	3	4
63.	Worker safety	1	2	3	4

Current Status

64. How would you describe the economic future of the plant where your fellow union members work? (Circle the answer closest to your opinion).

1. Very promising
2. Favorable
3. Difficult to say

4. Uncertain or questionable
5. Highly vulnerable, insecure

65. How would you characterize your last contract compared to the previous one? (Circle the answer closest to your opinion).

1. Major improvements
2. Minor improvements
3. About the same

4. Minor concessions
5. Major concessions

66. Your last contract negotiations resulted in:

1. A signed agreement
2. An economic strike

3. Employer lockout with a strike
4. An unfair labor practice strike

Thank you very much for your participation.

Appendix 3

Glossary of Terms

Self-directed work team: Also termed autonomous work groups, semi-autonomous work groups, self-regulating work teams, or simply teams. The work group (in some cases operating without a supervisor) is responsible for a whole product or service and makes decisions about task assignments and work methods. The team may be responsible for services such as maintenance, purchasing, quality control, and hiring.

Employee Problem-Solving Groups (Including Quality Circles): Structured employee participation groups in which individuals from a particular work area meet regularly to identify and suggest improvements to work-related problems. The goals of these groups are improved quality and productivity; there are no direct rewards for group activity; group problem solving training is provided; and the group's only power is to suggest changes to management

Job rotation: A planned rotation of workers among different jobs.
.
Total Quality Management Programs: Programs that focus on providing customers with error-free products or services through a process of continuous improvement.

Gainsharing: Gainsharing plans are based on a formula that shares some portion of gains in productivity, quality, cost-effectiveness, or other performance indicators. The gains are shared in the form of bonuses with all employees in an organization (such as a mill). They typically use employee suggestion committees and they differ from profit-sharing and ESOPs in the basis of the formula is some set of local performance measures, not company profits. Examples include Scanlon plan, the Improshare Plan, the Rucker Plan, and various custom-designed plans.

Employment Security Policy: Corporate or Mill Policy designed to prevent layoffs of permanent employees

Pay for Skill Program: An alternative to traditional job-based pay that sets pay levels based on how many skills employees have or how many jobs they potentially can do, not on the job they are currently holding. Also called pay for skills, pay for knowledge, and competency-based pay.

Profit-sharing/bonus program: A bonus plan that shares some portion of mill or corporation profits with employees. It does not include dividend sharing.

Removal of shift supervisors/delayering: Elimination of a level of management (including shift supervisor).