

INSTITUTIONALIZING AND DIFFUSING INNOVATIONS
IN INDUSTRIAL RELATIONS

THOMAS A. KOCHAN AND JOEL CUTCHER-GERSHENFELD

SEPTEMBER, 1987

WP 1928-87

**Institutionalizing and Diffusing
Innovations in Industrial Relations**

Prepared By:

Thomas A. Kochan and Joel Cutcher-Gershenfeld

With Additional Contributions From:

Robert B. McKersie, Harry Katz, Kirsten Wever, Anil Verma, Janice Klein,
Peter Cappelli, John Chalykoff, and Stephen Herzenberg

September, 1987

This research was conducted under the auspices of the Industrial Relations Section at the Sloan School of Management at the Massachusetts Institute of Technology. Support for the research was provided by the U.S. Department of Labor, Bureau of Labor Management Relations and Cooperative Programs (Contract No. J 9-P-4-0021). Supplementary support was provided by several of the companies and unions included in the study. The views expressed are solely those of the authors.

Table of Contents

I. Introduction	page 1
II. The Processes of Institutionalization and Diffusion	page 5
III. Employee Participation Processes	page 7
A. Variation in Worker Preferences	page 9
B. Collective Bargaining Shocks	page 10
C. Strategic Shocks	page 12
IV. Work Organization Reforms	page 13
A. New Facilities	page 14
B. Retrofitting Existing Facilities	page 17
V. The Introduction of New Technology	page 21
VI. The Role of Employment Security	page 24
VII. The Role of Gainsharing	page 26
VIII. Union Participation in Strategic Management Decisions	page 27
IX. Institutionalization of Innovations Within the Panel Sites	page 29
X. Strategies for Diffusion	page 31
A. Management Strategies and Choice	page 32
B. Strategies and Choices for Union Leaders	page 35
C. Strategies for Government Officials	page 35
XI. References	page 38
XII. Exhibits	page 41
1. Three Tiers of Industrial Relations Activity	
2. Overview of Research Sites	
3. "Humanware:" The Japanese Model	
4. Preferences Among "Quid Pro Quos" of Western Airlines Employees in Four Unions	

I. INTRODUCTION

The first half the 1980s witnessed joint experimentation and extensive innovation with new forms of labor-management relations. Concurrently, this period was marked by a growing polarization and intensification of tensions and conflict in U.S. private sector industrial relations. In our earlier work (Kochan, Katz, and McKersie, 1986) we interpret both tendencies as signals that many of the principles of what we term the New Deal industrial relations system are no longer well suited to the contemporary environment or to the interests of workers, employers, or the broader society (see Exhibit I).

Some innovative developments in industrial relations have proven fragile. In part, this can be traced to the current environment of increasing crisis and bitter conflict between labor and management in American society. While strikes were less frequent in the 1980s than in previous years since World War II, those that did occur were frequently hard fought struggles for survival, rather than tactical extensions of the collective bargaining process. More than forty percent of union members covered under major collective bargaining agreements experienced wage cuts or one or more years of no wage increase between 1980 and 1984. Many others experienced significant losses in real wages and decreases in coverage or benefit levels in medical insurance or other fringe benefit areas. Moreover, the long-term decline in the rate of union membership accelerated during the early 1980s. This was partly a reflection of overall employment declines in the sectors of the economy where union membership is highest, but it stems equally from greater and more open employer opposition to union representation in newly opened facilities (Dickens and Leonard, 1985; Farber, 1985). The early 1980s were also characterized by an increasing polarization in the relationships between the labor movement and government policy makers. Union representatives' frustrations in organizing and representing workers in the context of existing collective bargaining policies and procedures were heightened by a sense of powerlessness to modify these policies.

The central question motivating this monograph is whether the innovations and experiments in labor-management relations will diffuse to a broader array of bargaining

relationships and become institutionalized as regular aspects of labor-management relations. Alternatively, will they be aborted by the broader conflicts between labor and management or between labor and government policy makers over union representation and organization rights, or over the very role of unions in society?

To address this issue we have followed a number of innovations in labor-management relations for the past two and a half years. Our objective was to document the dynamics of change efforts, and to draw from them some initial propositions about the diffusion and institutionalization of change in labor-management relations during this important period in our industrial relations history. The purpose of this report is to offer a set of tentative principles that we believe will influence the institutionalization and diffusion of these innovations.

The innovations discussed here are drawn from a panel of nine companies and more than a dozen associated local and international unions. The parties participated in a two-year study conducted with the support of the U.S. Department of Labor's Bureau of Labor Management Relations and Cooperative Programs. These cases were selected because in each the parties had initiated one or more of the types of innovations that we believed challenged prevailing principles of the New Deal system. As such, these are neither representative nor random samples from the universe of contemporary collective bargaining relationships. Instead they are illustrative examples of the different avenues through which labor and management can change their bargaining relationships in ways that substantially depart from the traditional New Deal model.

These sites also can be described as falling within the middle range of economic pressure found in employment relationships today since they had experienced shocks of sufficient magnitude to initiate a change process, yet there was not so severe a crisis so as to make any response futile. Walton (in press) has recently described this as the level of pressure most likely to produce sustainable innovations.

This research has been centered on unionized settings. Many of the lessons have broader applications, but our specific concern is with the staying power of innovations in the context

of a collective bargaining relationship. As such, these settings already have the institutional capacity to resolve major conflicts and to codify relations into formal rules. The innovations examined here therefore emphasize building the capacity for increased joint problem-solving and flexible rules. The central question for these parties is: Can these new capacities be developed while the traditional strengths of collective bargaining are preserved? For non-union settings the institutionalization of change is no less important, but the key tensions are often different.

Our sites and the nature of the changes occurring in each are outlined below and classified in Exhibit 2 within the three tiered framework we use for analyzing contemporary employment relationships.

The United Automobile Workers Union (UAW) and General Motors (GM):

Our focus in this case was on the new Fiero and Lake Orion assembly plants, both of which feature a fundamental reorganization of work design. The roles of labor and management have been significantly modified to afford employees greater autonomy, less supervision, and, in the case of Fiero, union representation in all plant-level strategic and administrative decisions. During our research the joint design and creation of the Saturn Corporation was also solidified and the GM plant in Fremont, California, was re-opened (after a two year shutdown) as a joint venture with Toyota. We followed some aspects of both of these developments as well.

The Amalgamated Clothing and Textile Workers Union (ACTWU) and Xerox:

The seven plants in Xerox's home manufacturing complex (near Rochester, New York) show how narrowly focused quality circles can evolve to encompass multiple forms of employee participation and innovation in the organization of work, all of which is reinforced via contractual language including a no-layoff guarantee, joint decision making regarding outsourcing, and gainsharing. Further, the parties have built on a history of informal consultation about strategic issues with the establishment of joint "horizon" planning committees on human resource management and other issues, the joint design of a new manufacturing facility, and union involvement in new product development.

The Air Line Pilots Association (ALPA), the International Brotherhood of Teamsters (IBT), the Association of Flight Attendants (AFA), and the Air Transport Employees (ATE) Western Airlines:

A financial crisis brought on by industry deregulation led Western to pose concession demands to all four unions. Though each of the negotiations was different, all four unions ultimately emerged with significant minority stock ownership for the members, a seat on the board of directors, and, in one case, an agreement to pursue greater employee participation in daily decisions. Of particular interest is the great variation in the strategies selected by the four unions.

The International Association of Machinists (IAM) and the Boeing Corporation:

Rapid advances in manufacturing technology led the union to push for joint roles in the exploration, selection, and implementation of new technology. The operation of the joint structure that evolved over the course of two contract cycles in Boeing's Seattle, Washington, facility and a parallel quality circle effort were the focus of this research.

The Aluminum, Brick and Glass Workers Union (ABGWU) and Alcoa:

A rolling mill, in a highly competitive portion of the aluminum industry, was the setting in which these parties attempted to guide employee involvement activities and work re-organization through a period of major wage and benefit concessions. The concessions also reflect decentralization of bargaining in the industry. We explore the consequences within the local union and in a range of joint activities.

The United Automobile Workers (UAW) and the Budd Company:

These parties have sought to sustain employee involvement initiatives, limited just-in-time delivery, and quality control improvements. These changes have been prompted by customer pressure in the context of the highly competitive auto supply industry. During our research, efforts were initiated to link plant-level participative activities to cooperation at the corporate/international union level. Also, one local negotiated an agreement to accept significant work rule changes and the use of a team concept approach to work organization in return for reinvestment in its facilities.

The Diesel Workers Union (DWU) and the Office and Clerical Unit (OCU) and Cummins Engine:

After nearly a decade of experimentation with the design of non-union facilities based on socio-technical principles, the parties are now trying to integrate these innovations into the company's unionized home manufacturing complex. We have followed the diffusion of new systems for the organization of work, as well as related changes in collective bargaining as they have evolved during a period of layoffs and management turnover at the corporate level.

The Paperworkers Union and Boise Cascade Corporation:

Two decades of low performance in the company's newest and largest facility -- partly connected with an increasingly complex set of work rules -- led to company bargaining demands for a sweeping revision of the contract and hundreds of attached memorandums of agreement. After a lengthy strike, the company prevailed, and imposed a contract with only four job classifications, a team-based, flexible work organization, a no lay-off pledge covering current employees and substantial wage increases for those affected by the job classification changes. Critical questions in this case concern the implementation and evolution of such changes when they are imposed by hard bargaining.

The United Rubber Workers Union (URW) and Goodyear Corporation:

Gradually, over about ten years, the parties have made a series of incremental changes in the organization of work and the structure of union-management relations in their Lincoln, Nebraska facility. We were interested in the process and results of these changes.

Longitudinal case studies were conducted for each site by one or more members of our research team. Interviews ranging in number from fifteen to over one hundred were conducted in each case. In some of the cases we were also able to draw on previous case studies or related research emerging from our earlier work. Employee surveys were conducted in three cases (Western, Boeing, and Xerox). In one case (Boise Cascade) we were able to conduct a formal economic analysis of the effects of the changes introduced.

Midway through the study we conducted a conference including the union and management representatives from the panel sites. A second conference was held near the end of the second year of the project. In addition to receiving feedback on their cases, the parties had an opportunity to learn from each others' experiences. In some cases the conferences led to some reassessment of organizational strategies. In at least three cases, the parties implemented organizational changes as a result. Thus, what is reported here is not just a set of independent cases from which the researchers remained completely aloof. However, neither did the research team serve as outside consultants or facilitators. Instead, the cases should be seen as a set of relatively isolated change efforts which, over time, evolved into a network of shared experiences. We will return to this point later in this report when we present strategies for the further diffusion of innovations since we believe the joint learning process that evolved in this project holds significant relevance for future public policy initiatives.

II. THE PROCESSES OF INSTITUTIONALIZATION AND DIFFUSION

The concept of institutionalization has a long history within the behavioral sciences. It rests, in part, on Kurt Lewin's (1947) seminal studies of social change, which positioned institutionalization as the end point of a multi-staged change process. The first stage of the process is often referred to as the process of "unfreezing" current organizational practices.

Stimulating or motivating change is usually some crisis or set of severe external pressures. The second phase of the change process normally involves implementing a set of experimental or demonstration projects. The focus at this stage is on the factors that lead to and then maintain the parties' commitments to the proposed changes, and also on the evaluation of initial results. The third phase is the institutionalization phase, viz., the process by which changes are integrated into on-going practices within the organization. This can be thought of as a refreezing process, though one of our conclusions is that this final institutionalizing stage is best thought of as dynamic, rather than static in nature.

Lewin's model provides a useful starting point for our analysis, but, we adapt it to fit the current context of industrial relations. We are not primarily interested here in the initial stimulus for change or the unfreezing of past practices -- the first stage of the model -- except in so far as different forms of unfreezing have implication for what follows. Instead we will focus on the second and third stages and examine how changes, once initiated, evolve over time. We thereby try to explore what sustains or undermines an institutionalizing process. Thus, in this study we focus on the management and union strategies and actions that affect institutionalization. While we recognize that developments in the external environment also have important effects on the course of these innovations, we have discussed the importance of these external factors elsewhere (Kochan, Katz, and McKersie, 1986). Our goal here is to elaborate more fully on the internal dynamics of these processes.

We define institutionalization as the dynamic process by which daily practices and decision-making at the workplace, collective bargaining, and strategic levels of industrial relations are linked so as to respond to the environment confronting the parties and their independent needs. As the summary in Exhibit 1 of our earlier work indicates, we believe that achieving this type of effective linkage in today's environment requires fundamental transformations in practices across all these levels of industrial relations activity. In the paper we focus on the following specific practices: employee participation, flexible forms of work organization, participation in new technology decisions, employment security, gainsharing, and participation in strategic management decisions. We see these as central features of what

might be thought of as a new industrial relations system that is more responsive to the demands of the environment and the needs of the parties. At the same time, however, we don't claim that these exhaust the range of innovations underway in American industrial relations or that they constitute the sole characteristics of any new system.

Further, none of the changes we will discuss can be described as fully institutionalized into current practice. Instead, each of these innovations continues to face internal obstacles to its continuity and, over time, contradictions between events occurring at the different tiers of the relationship continue to emerge. We see the institutionalization of these changes as a continual attempt to overcome these internal contradictions. The more successful the parties are in addressing these internal contradictions as they arise, the greater is the chance that these changes will be sustained and, ultimately, translated into regular, ongoing practices, as well as into accepted norms and values.

Finally, we are interested not only in the conditions under which these changes permanently transform a given labor-management relationship but also in how widely these innovations will be diffused throughout a given organizations and across North American industry. A final section of this report will therefore discuss the prospects for the wider diffusion of these changes.

III. EMPLOYEE PARTICIPATION PROCESSES

By far the most frequent innovation initiated in industrial relations in the early 1980s was some form of employee participation. As indicated in Exhibit 2, some type of QWL or similar participation effort was initiated in eight of the nine cases in our panel. Many of these efforts came to be tied to work organization changes and technological change, which are discussed in greater detail in the following sections of this report. The focus here is just on participation.

An examination of the evolution of these various processes indicates that in no case has it diffused smoothly over time to a point where a large majority of employees are now actively participating in QWL problem solving teams. On the other hand, it has been

completely abandoned only in one case. Typically, the parties experienced an initial period of growth and enthusiasm, followed by what appears retrospectively as a predictable crisis. This crisis was usually characterized by a decline in further employee volunteers to participate in the process, resistance by middle and lower managers, and opposition by some union leaders -- all of which is often prompted by developments in other aspects of the management organization, the union organization, and the collective bargaining relationship. Thus, the resulting plateau in the growth of the QWL initiative raised fundamental questions about the extent to which it could or should affect the economic interests of the firm, the employees, and the union. The parties were then forced to choose whether to reinforce or abandon the effort.

Because of the relatively modest costs of initiating QWL processes, we have concluded they can serve as useful starting points for building trust and exposing employees, supervisors, managers, and union leaders to participative methods of interaction and joint decision-making. However, it is increasingly clear that they cannot remain in this narrowly-focused, adjunct mode. Where the parties have recognized this, what started out as a narrowly focused QWL process became a catalyst for participative problem-solving methods in a wide variety of areas involving work organization, the introduction of new technology, strategic planning, and planning for new facilities.

This transition is politically difficult, however, since the broader the scope of issues addressed in a participative mode, the more likely the process is to touch on issues covered in the collective bargaining contract or other areas of management decision-making -- areas that are usually designated as off limits to the QWL process. It is not surprising, therefore, that many QWL processes never make this transition. Yet, standing alone, the narrow forms of QWL are not likely to make a sufficient enough contribution to the competitive strategies and objectives of the firm, or to the economic and social interests of workers and the union, to sustain widespread support.

Several factors explain the failure of QWL processes to diffuse smoothly and completely across the organizations we studied. Ironically, each of these factors also helps to explain

the successful evolution of QWL. That is, these factors are best understood as predictable dilemmas that can either undercut or reinforce QWL efforts, depending on how they are resolved. In the process, one way or another, these factors transform the nature of QWL.

Variations in Worker Preferences:

Numerous surveys have shown that a high proportion of blue and white collar workers express an interest in participation in decisions involving how to perform their jobs. Surveys conducted at Xerox, Western, and Boeing supported this finding. Between 80 and 95 percent of workers indicated an interest in participating in decisions involving their jobs. Yet these surveys also found mixed reactions to the specific forms of participation embodied in QWL or related problem-solving, team activities. For example, 88% of the surveyed employees in one plant at Xerox reported they liked the idea of employee involvement, 85% reported wanting more say in their job, and 88% reported wanting management to share more business information. Yet, at the time of this survey (three years after the beginning of the QWL effort) only about thirty percent of the employees had volunteered for QWL teams, and only about 11% of those not currently participating in an EI team indicated they would be interested in joining a team. A similar set of results was found in a survey of non-participants in Boeing's quality circles. Further, nonparticipants gave less favorable evaluations of the contributions of the QC process to improving plant operations, quality, and labor-management relations, than did participants. At Boeing less than twenty percent of employees were in QCs at the time of the survey, and less than half of the remaining non-participants expressed any interest in joining a QC.

A close analysis of the variations in employee preferences regarding participation suggests that a self-selection process was at work in both organizations (Cutcher-Gershenfeld, 1986; Verma and McKersie, 1987), which was then further exacerbated by experience. Those workers with high preferences for teamwork and group problem solving activities were the first to volunteer to participate in QC activity. Those with positive experiences with the process strengthened their commitment to the process over time. However, some became disenchanted or lost interest as the process began to plateau, and discounted the achievements of the

groups. Non-participants had lower preferences for regular group involvement to begin with, and also devalued the achievements of the groups. Thus, while many of the non-participants endorsed involvement in workplace level decision-making and problem solving in principle, a significant proportion of them did not see formal, weekly problem solving meetings (as practiced by QWL teams) as their preferred means of participation. Based on these survey findings and our field interviews, we conclude that more varied options for involvement may be necessary to match the interests in participation of different employees. The Xerox case provides one example of how this can be done.

Xerox. The above survey results prompted Xerox and ACTWU to allow the parties in different work units to adapt the participation process to the particular needs and preferences of each group of employees. One plant, for example, is divided into approximately forty different Business Area Work Groups (BAWGS) which meet on a bi-weekly basis for feedback on performance, safety, and other factors. This is a mandatory, minimum level of participation. It involves workers, supervisors, engineers and union officials. Beyond this level, individual group members have the option to form formal problem solving teams, temporary task forces to solve specific problems, autonomous working groups (operating without a supervisor), or to serve as "individual contributors." This flexible form of participation allows each BAWG to take into account the varied preferences for involvement found within the work unit. The key constant, however, is a commitment to a participatory decision-making mode of interaction. In other parts of Xerox autonomous work groups, temporary task forces, and joint planning teams are used in various combinations, reflecting the same contingent principle that underlies the BAWG concept. Thus, what started out as a narrow but standardized EI process has evolved into multiple modes of applying the principles and techniques of participation to a range of temporary and recurrent problems and issues, using a variety of different methods and personnel.

This experience illustrates how a naturally occurring crisis (namely, the decline in interest in problem solving groups) became the vehicle for reinforcing and substantially extending participative activities. In the process, however, the nature of employee participation was substantially transformed.

Collective Bargaining Shocks:

Variations in worker preferences are often opaque until they are thrown into sharp relief by a shock or crisis event. Collective bargaining is one such event, and can potentially bolster or cripple participative efforts. The strong impact of collective bargaining on these efforts follows from the fact that such negotiations remain the central forum in which the parties confront the issues over which they have the most significant differences in interest.

Sustaining QWL and other forms of cooperative problem solving at the workplace requires a particular way of managing the conflicts that are channeled through the negotiations process. Walton and McKersie (1965) described this challenge as one of resolving the behavioral dilemmas required for carrying on hard bargaining and problem solving within the same relationship.

Several of the cases in our panel experienced slowdowns or complete blockage in the diffusion of QWL processes, as a result of conflicts or contract changes in collective bargaining which employees believed to be inconsistent with the trust and commitment involved in workplace participation. In some cases these were temporary set-backs; in others the climate was sufficiently chilled to halt further diffusion. At the same time, collective bargaining agreements on employment security, gainsharing, and other issues have provided essential reinforcements to QWL efforts.

Xerox. Less than two years into its QWL process Xerox made a decision to reduce its blue and white collar workforce. The combination of the layoffs and internal bumping that resulted not only disrupted some of the QWL teams, but also eroded trust and support for the process among workers who felt the layoffs were inconsistent with the commitment and efforts they were asked to put into participating in solving workplace problems. Later, in their 1983 contract negotiations, the union and company made what proved to be very unpopular modifications to the absenteeism policy and to the health insurance package. In the same negotiations the parties negotiated a no-layoff guarantee and established the principle of joint discussion of outsourcing. For those employees who were skeptical of QWL, the absenteeism and health benefit changes were seen as inconsistent, and cause for giving even less support to joint efforts. For employees who valued the QWL process, the no-layoff guarantee and outsourcing language were more salient as reinforcement and validation. Thus, collective bargaining amplified (in two, opposite directions) the employees' responses to QWL.

Alcoa. Changes in absenteeism policies, similar to those at Xerox, along with deep wage concessions, led to the disbanding of the plant union-management steering committee that oversaw a participation process that had been underway for two years. The concessions also led to a significant decline in volunteers for the training needed to join a participative group. After approximately a six month hiatus, however, a new steering committee was formed and the participation process was revitalized. The revitalized process reflected important learning about employee preferences, and was less constrained to a single form of group problem solving. Instead, the new efforts focused more directly on quality and productivity problems by using a variety of different processes including statistical process control training and methods, semi-autonomous work groups for selected operations, socio-technical planning processes for designing and installing a new cold mill operation in the plant, an expanded joint apprenticeship program, and expanded joint information sharing programs. While these more focused participative efforts have gained momentum in the plant over the past several years, the legacy of employee discontent with the concessions continues to divide the local union. Employees and union leaders are strongly interested in negotiating a form of gain-sharing or other compensation

arrangement that allows them to recoup their wage concessions and to be rewarded for their contributions to the plant's competitiveness. Though these efforts have not yet been successful, they reveal the way collective bargaining can reinforce or set back workplace level participation efforts. The success of these efforts may well depend on whether or not a gain sharing or other compensation arrangement is negotiated, which employees perceive as an equitable response to their flexibility and participation at the workforce.

Strategic Shocks:

Though distant from workplace participation activities, strategic level decisions by managers and labor leaders can thoroughly undercut or completely transform these activities.

Though similar to collective bargaining in effect, the potential impact is much farther-reaching.

Cummins. The imposition of a major layoff by management in a unilateral fashion, without consulting the union, or using the QWL process to explore alternatives, dealt a severe blow to the commitment of union officials and workers to the QWL activities initiated in the company's Columbus, Indiana facilities. In this case QWL efforts had been reinforced by negotiated language giving management and union representatives at the plant level the right to increase flexibility by reducing job classifications. In another situation the parties agreed to simplify work rules in return for union recognition in a new parts distribution center. Specific joint union-management efforts and discussions continue to focus on job preservation and creation, but the layoff of approximately 10% of the blue and white collar workforce in 1986 brought union and worker support for QWL activities to a halt. It was the unilateral nature of this management decision and its inconsistency with the principles of participation and consultation that killed the QWL process in this case.

In other settings, crisis events involving strategic decisions have been handled differently and ended up reinforcing participative activities. At Xerox, the first such crisis involved the threat of subcontracting the work of a group of people making and assembling wire harnesses. If the corporation had decided unilaterally to subcontract, the union would have withdrawn from QWL. When it was decided, instead, to examine the issue with a joint study team, the principle of participation was significantly extended. At Budd, management had to decide whether or not to reinvest in an old plant. It agreed to do so after bargaining with the local union for accompanying changes in the job structure and the organization of work. The investment reinforced collaborative efforts at this local and with the international. The case of Alcoa involved a decision about how to organize the work system in a new cold roll mill. Here again, the adoption of a highly participative design process complemented other forms of employee involvement. At Boeing, the issue was joined via an agreement for collaborative

discussion over whether and how to experiment with new forms of work organization as new technology is introduced into existing facilities. In each of these cases the participation process and other aspects of the labor-management relationship were addressed so as to complement one another. In each case the situation could have deteriorated and the change become a point of controversy. Successfully attending to these issues not only reinforced, but extended and transformed participation.

The key determinant of whether or not the transition to larger aspects of the relationship is made successfully appears to be the willingness of top-level management and union leaders to assert their commitment to the principles of problem solving and participation in the face of new, potentially contentious situations. By doing so, they can transform what was an incremental program for diffusing QWL teams into a set of principles to be applied to a range of crises or opportunities that might benefit by problem solving processes.

IV. WORK ORGANIZATION REFORMS

During the first half of this decade many employers pressed hard to increase flexibility in work rules and in the organization of work. In a broader survey Cappelli and McKersie (in press) noted that in the majority of cases management pressed for work rule changes primarily so as to reduce costs by shedding labor. In some cases, however, the goal was also to introduce new concepts of work organization. This was especially true where the 1) economic and technological environments facing the parties have changed in significant ways, 2) an alternative model of work organization was available to the parties to draw on (often from elsewhere within the firm), and 3) new employment security provisions were used to gain acceptance of the changes.

Although the specific features of these new systems vary, their central characteristics are outlined in *The Transformation of American Industrial Relations* (1986). Employer interest in new forms of work organization arose out of a desire to tap the motivational advantages usually associated with broad task designs (Hackman and Oldham, 1979) and the need to overcome the rigidities and high costs associated with traditional work structures and rules.

In addition, new technology that promises increased flexibility in production requires, for its optimal performance, equally flexible human resource management systems and work organization arrangements (Shimada and MacDuffie, 1986). Thus a concept that first gained favor among behavioral scientists as a means for increasing motivation and job satisfaction through broader job designs (Hulin and Blood, 1967; Turner and Lawrence, 1967; Walton, 1979) has now gained the support of many line managers because of its strategic importance in lowering costs, increasing quality, enhancing adaptability, and achieving full utilization of new technology.

In our panel, we observed all nine firms either implementing changes in work rules and new work organization design principles, or planning or attempting to implement these concepts for selected operations. Two firms (GM and Xerox) used these concepts in designing new facilities; four firms (Xerox, Boeing, Western, and Boise Cascade) negotiated work rule changes in collective bargaining; four firms (Alcoa, Cummins, GM, Xerox) used problem solving principles and processes to introduce these concepts into selected work units within existing facilities; and two firms (Boeing and Budd) were in the process of discussing the introduction of flexible work systems on a selected basis at the time our case studies ended.

New Facilities:

By far, the most successful introduction of flexible work organization concepts has been in new or "greenfield" worksites. This is hardly surprising, since at a new site a new workforce can often be selected based on the ability and desire to work within flexible or teamwork systems. In the 1970s most of the plants that opened on this basis were (and still are) nonunion. More recently we have seen a number of new or completely refurbished unionized plants using flexible work systems. We limit our discussion to the use of these concepts in the unionized worksites.

GM. Consider the way self-selection, even in a unionized setting, contributed to the different experiences of GM's Pontiac Fiero and Lake Orion plants. Both were new or completely remodeled and retooled facilities, and the human resource management strategy for each was based on the team concept, or, as GM calls it, the "operating team" concept. Workers from both plants came largely from a Fisher Body GM plant that had been closed and was later refurbished (retooled) to form the Fiero assembly plant. The workers were told prior to choosing to stay at the Fiero site that the plant was designed around a

teamwork concept and that anyone who requested to stay at the plant should be prepared to work under this type of system. This undoubtedly created a self-selection process among those who requested to stay at the Fiero plant, rather than work at the nearby Lake Orion plant. The union leaders who chose to go to Orion were not sympathetic to either QWL or teams, while those who chose Fiero were willing to experiment with QWL and the team concept.

The greenfield sites opened on a nonunion basis in the 1970s relied on human resource management professionals to provide the input into the design of the new work systems. In contrast, the cases in our panel that were most successful in introducing these new concepts involved workers and union leaders in early stages of the design and planning processes.

Xerox. In 1983 the company decided it needed to build a new toner supply plant. Rumors leaked to the union that the company planned to build the plant in the South because of lower utility, tax, and labor costs. The union leaders questioned management about its plans and proposed to work with management to see if the plant could be built and operated competitively in the Webster manufacturing complex. The company agreed, and a set of workers and union representatives were designated to work with management representatives to examine and test new work and machine design concepts while union and company representatives began negotiations with the local public utility and local government to lower energy and tax costs for the new facility. The plant design and equipment selected together promised significant productivity gains and the negotiations with local government and utility representatives were successful. The result was that the plant was built in the Webster complex at costs and projected productivity levels equal to or better than the levels forecast for the plant if it was relocated in the South.

GM. The most widely publicized joint union-management plant design in the GM system involves the new Saturn Division. After the company's engineering and financial planners decided in the early 1980s that it was unprofitable to try to build a small car in the U.S., GM signed import agreements with two Japanese firms. In 1983 GM addressed the issue again, but this time invited the UAW to participate in the planning process. The result was an agreement to build small cars under a new division of GM (Saturn). The design principles included in the new agreement provide for: (1) operating teams of workers on the shop floor in a single job classification, (2) consensus decision-making principles throughout all levels of the organization (3) UAW representatives facilitating the operating teams and being represented in the management structure at all levels of the organization from the shop floor to the plant management administrative staff, to the "Strategic Advisory Committee" which provides the link between the Saturn Division and the executives of GM.

While Saturn is the most visible example of new flexible work systems in General Motors, the corporation has sought to introduce these concepts in most of its new or newly refurbished plants. To date, over a half dozen such facilities are operating effectively. Still, GM's new plants have not all been equally successful, or at least have not followed the same paths in introducing the new team concepts.

Again, the comparison of the Fiero and Orion plants is instructive. General Motors

management designed the technology and manufacturing plans for the Orion plant around the use of flexible work systems. For a variety of reasons, the union was not actively involved in this process. Under the national contract, however, management had the right to design the plant and start it up with the new work system. After one year, management was then responsible for negotiating an initial contract with the local union, in which the job classifications and related work system arrangements were negotiable. After a protracted period of negotiations and considerable conflict between local union leaders and plant managers, a distinctive local agreement was negotiated that allowed workers to choose between working under the pay-for-knowledge compensation plan and flexible work systems, or under a traditional pay system (though still with the requirement of knowing a minimum of two jobs in a given area). Thus, instead of a jointly developed system, the parties in effect split the difference.

In contrast, local union representatives worked with management to design the work system for the Fiero plant. This experience also facilitated the development of a broader role for the union in the management of the plant. This was all agreed to at Fiero prior to the start-up of production, and no deep conflicts between the parties occurred in subsequent negotiations or in the administration of the initial agreement.

The differences between the Fiero and Lake Orion cases suggest that failure to develop a joint commitment to the design principles prior to their implementation will increase the likelihood of conflict and resistance to these new forms of work organization and compensation. This is especially the case with workers and/or union representatives whose prior experiences are limited to the traditional system. Once the new system is implemented, however, it represents enough of a structural change and it often begins to attract enough supporters that the burden of change then falls on those seeking to return to the traditional system.

Our experience to date suggests, then, that the greenfield site model works most effectively when new workforces are recruited and socialized into the new system without carrying over the traditions and customs from the traditional model. However, it is also quite

clear that workers who are used to traditional systems can be transferred into the new team concept plants. Two conditions appear necessary to make this transfer strategy work. First, transfer into the new system works best when it is voluntary so that only those who are predisposed to accepting the new arrangements choose to do so. Second, the successful transfer seems to require that workers and their union representatives participate early in the planning, guaranteeing them some influence over the work, compensation and governance principles of the new facility. The first condition ensures a maximum degree of homogeneity in employee preferences about work organization. The second helps to ensure that whatever differences remain are addressed from the outset, rather than on a post hoc, reactive basis.

Retrofitting Existing Facilities:

Our cases suggest it is much more difficult to retrofit existing facilities with new work systems. Indeed, throughout the U.S. and Canada, there are very few cases where the work organization or work rules covering a complete facility and the complete workforce have been changed by way of a cooperative union-management problem solving process. (Note, however, that Fiero is close to a retrofit example. Still, there was a period of roughly 2 years between the Fisher Body closing and the start of the Fiero assembly.) The only case in our panel where a complete shift from a traditional work system to a more flexible system occurred was a case where management took a long strike and imposed the new system as part of the strike settlement.

Boise Cascade. In 1984, after management had made several unsuccessful attempts to reach informal agreements with union leaders to eliminate what management viewed as an overly rigid set of job classifications and work rules, a nine-week strike over a new contract occurred in the company's DeRidder mill. This was a relatively new mill (opened in 1967) and represented a massive, billion dollar investment; but it had a poor productivity and profitability record. The major issue in the strike was management's demand to eliminate the large number of past practices that had built up over the years, and to collapse the work organization structure down into a small number of job classifications. After nine weeks the union accepted management's terms -- largely in response to threats from this high-wage employer that it would hire a replacement workforce. The settlement provided for a no-layoff guarantee, and a guarantee that no worker would face a pay reduction. In fact, a majority of workers received large pay increases as they were transferred to the new pay structure. A year and one half after the end of the strike, the workers voted to continue the new system. Still, the leadership of the union is in flux and plant performance has not shown dramatic improvements. Thus, it remains to be seen whether this avenue innovation will be effective and whether it can be sustained.

This case illustrates that it is very difficult to use a problem solving approach to achieve an immediate and complete change within an existing facility. The changes that management wanted were just too vast for the union to discuss until it had no other choice. It may be that only a hard bargaining strategy by management, with a high probability of a strike, can achieve wholesale change all at once. Even then, as part of the new arrangements, the employment and income security interests of the incumbent workforce need to be addressed and the ultimate outcome remains uncertain.

Because it is difficult to change the work organization of an entire plant all at once, the more typical strategy observed in the panel was an incremental process in which natural "opportunities" (threat of job loss, prospect of obtaining new investments, etc.) provided the stimulus to change. What, then, has been the experience with the incremental retrofitting of existing facilities? Here our cases provide much evidence.

Xerox. In 1982, after management announced its intent to contract out wiring harness production, the union persuaded management to place the decision on hold and to establish a special study team to explore changes in the organization and management of the wiring harness unit that would make it cost competitive. The team's recommendation cut the costs of production by an estimated twenty-eight percent, and thereby saved the work. However, these recommendations required changes in the managerial formulas for calculating overhead, revising supervisory ratios, and other decisions that had to be made by top management. The changes also involved a number of modifications to seniority, job classification, transfers, and temporary work. Thus, the task force's recommendations had to be referred to the union and company bargaining committees for approval. Approval was granted as part of the 1983 contract. In fact the negotiators went an important step further by agreeing to use the wiring harness study team concept as a model for dealing with uncompetitive operations in the future. As noted earlier, employment and income security guarantees for incumbent workers were included as part of the agreement. Since this agreement, five other study teams have been formed, four of which have kept work in-house -- leading to a range of modifications in work organization in different areas.

Cummins. Innovation occurred here in response to a management announcement that a line responsible for a particular engine was to be shut down and moved from the unionized Columbus, Indiana plant to the company's newer nonunion plant (one of the most highly publicized nonunion team-concept plants opened in the 1970s) in Jamestown, New York. The Diesel Workers Union asked to have an opportunity to save the work. Both parties ultimately agreed to a reorganization of the work into fewer job classifications and other flexible arrangements. This line now operates with these new arrangements inside a plant governed by traditional concepts and work rules.

A similar development occurred at the Indianapolis parts center, a distribution operation that was scheduled to close. The company agreed to keep this work under the jurisdiction of the DWU if costs could be brought down to a level competitive with

nonunion options. The union agreed to eliminate the multiple job classification system and replace it with a single pay grade and flexible movement of workers across tasks. These workers earn more than do comparable workers in another unionized parts center that is organized in a traditional fashion. However, the Indianapolis employees also have more duties assigned to them than the employees working under the traditional system.

It should be noted that this pay and progression plan had been introduced by management at Cummins in several successive rounds of negotiations dating back to 1979. However, each time rank-and-file opposition kept the union from agreeing to it. Thus, this case illustrates again how the threat of job loss has been used by employers to achieve changes in work rules and work organization for specific groups -- especially in the face of predictable general opposition by the workforce.

Just as the threat of job loss has been used to induce changes in work organization, so too has the potential for gaining new work or new investments been used as a lever to introduce changes. In the Xerox toner plant example it was the union that took the initiative in getting management to consider locating the new plant in Rochester. At Fiero workers knew that if they were not able to assemble the new Fiero sports car at low costs, the plant was likely to be permanently closed, as the site was too small for other operations. In other cases in our panel, management initiated discussions with the union over the possibility of locating work in an existing site, or allocating new investments to bargaining unit personnel, in return for adopting flexible work organization concepts.

For example, at Alcoa, the start up of a new cold mill gave union and management representatives in Lebanon the opportunity to experiment with and agree to implement new work system concepts. As our case study ended, Budd and the UAW had just completed negotiations on a new work system for an area in one of their oldest plants, as part of the company's agreement to invest in and modernize this area of the facility. In this case, even though the change was not a wholesale plant redesign, it still raised important top-level policy questions for the company and the union.

Budd. Several years after the start-up of an employee involvement program between Budd and the UAW, the plateauing effect observed in other cases began to occur. In addition, tensions were building as some managers expressed a desire to move on to bigger issues involving work rules and other practices that they felt limited productivity. In response, tensions were building within some of the union locals over the question of whether the EI process was to be kept separate from collective bargaining issues. It became clear that if the process was to move forward, it would take a visible signal of support from both the top executives of the company and the leaders of the international union. Therefore, company and union leaders held a one day leadership meeting with key plant managers, industrial relations staff, and union officers and employee involvement facilitators, to take

stock of the current situation and set new directions. The meeting included presentations by company and union officials and outside researchers and consultants, as well as break-out group meetings to identify driving and restraining forces affecting the EI process. A central conclusion of the break-out groups was that there should be on-going top level meetings between company executives and union leaders to sort through the obstacles restraining the parties from addressing the bigger issues affecting the competitiveness of the various plants that had in the part been off limits to the EI process. Several such meetings were held. One achievement of these top level meetings was an agreement to encourage union and management officials in one of the plants to redesign the layout and work system of a part of their facility, so as to ensure a major reinvestment for the facility. This agreement was then successfully negotiated, and the necessary investment funds were committed to the plant. As such, this represented a mixture of strategic bargaining (committing new investment dollars in return for work reorganization) and an expansion of the participation process beyond the original boundaries of the EI process. This could not have been done without transforming the original workplace level EI process to a top-level corporate union-management leadership process.

The converse is also true: where employment was not directly threatened, workers may resist change. The Lake Orion assembly plant was a \$500 million investment. Workers there has some reason to expect that management would not close such a new and costly facility. This may well have strengthened the resolve of the local union at Lake Orion to resist new work organization and participation processes.

Across the research sites, the parties were most successful in taking advantage of opportunities for change in relationships where 1) prior experience with worker participation had established a climate of trust and commitment to the use of problem-solving principles and 2) management demonstrated a willingness to provide greater employment security and investment funds in return for flexibility and cooperation. Moreover, the interdependence among rules governing job classifications, seniority, compensation, production standards, etc. means that changing one work rule normally sets off a chain reaction requiring changes in a broad range of other practices (Cappelli and McKersie, in press). Thus, these work reforms not only "unfroze" a broad array of customs and practices valued by union members and leaders, they also required fundamental changes in management styles of decision-making, organizational design, compensation and staffing practices, and investment and resource allocation strategies.

In each case, the process of achieving changes in work organization involved a mixture of problem solving and participation along with hard bargaining and negotiations. The problem

solving was needed to determine what changes might be viable. The hard bargaining was needed to address the concerns of union leaders and/or rank and file workers, thus building commitment to these changes. It was also important to ensure the commitment of management to making the new investment and/or to maintaining or expanding current employment levels.

While there is limited direct evidence to bear on this point, we would expect that the more these changes are implemented unilaterally by management or in the face of severe opposition by rank-and-file workers or their union leaders, the harder it will be to sustain these flexible and high commitment attributes over an extended period of time.

The difficulties of a purely adversarial approach were clarified by a case outside of our panel, in which General Electric decided to locate a "factory of the future" within its large unionized manufacturing unit in Lynn, Massachusetts. In this case management unilaterally decided to locate the new investment -- a state-of-the art-machining center -- in Lynn if the union agreed to three basic changes in the bargaining agreement covering these employees: 1) a significant reduction in job classifications, 2) a new pay plan, and 3) a new continuous shift work schedule. After much internal controversy the local union leaders agreed to these changes and the rank and file approved the agreement. Several months later, however, all the union officers who supported the new agreement were defeated and a new slate of officers, opposed to the agreement, came into power.

V. INTRODUCTION OF NEW TECHNOLOGY

The introduction of new technology represents one of the oldest avenues for changing industrial relations, since nearly all changes in technology have effects on the number, mix, and content of jobs. The advances in micro electronics that fuel the current wave of technological innovation have these traditional effects. However, there is a growing consensus among technology and work specialists that the specific effects of these new technologies vary depending on the objectives driving their use, the means by which new technology is implemented, and the links forged between the technology and the human resource/industrial relations practices of the parties (Walton, 1983; Pava, 1985; Shimada, 1986; Chalykoff, 1987).

iii

The introduction of new technology clearly serves as a major opportunity for unfreezing existing industrial relations practices and traditions. We also see it as an extremely powerful avenue for stimulating and institutionalizing innovations. More than any of the other starting points for innovation discussed in this report, it serves as a natural opportunity for change, and an opportunity for the parties to adapt practices in ways that serve their joint interests. At the same time, technological change can serve as a major source of conflict, resistance, and struggle for power between the parties, since it strikes so deeply and directly at the vital interests of the firm, the workforce, and the union.

have already touched on a number of examples within our cases where new technology was involved in the introduction of change. All of the propositions or principles we suggested involving changing work organization arrangements apply equally to the introduction of new technology. However, several additional propositions are suggested by our work in progress with panel members involved in major technological innovations. Two central propositions emerge out of this work: (1) when management makes massive investments in new technologies without consciously and successfully using the new investments in order to introduce innovations in industrial relations practices, it faces a longer learning curve for making the technology work, greater resistance by employees to the fullest utilization of the technology, and less capacity for continuous learning and improvement in the performance of the new technology and work system; and (2) technology strategies that fully integrate human resource considerations require fundamental and lasting changes in the roles of union leaders, workers, and managers, in their relationships, and in the design of the organization. Major technological change will inevitably have implications for the social side of the organization. If these are not addressed directly there will inevitably surface important questions about organizational structure and the orientation of employment relations. We will draw on work under way at two panel firms to illustrate these points: GM and Boeing.

The joint venture between GM and Toyota at New United Motors Manufacturing Incorporated (NUMMI) in Fremont, California provides a good deal evidence regarding how effective integration of technology and human resource management and organization design

principles can improve industrial relations and organization performance. The NUMMI experiment also illustrates how the concept of technology must itself be broadened to encompass the total array of organization design and human resource management principles and practices. The NUMMI experiment relies on principles of high worker motivation, organizational learning, flexible job and work organization, advanced inventory and quality control, and employment security -- many of which were first introduced in Europe by socio-technical design theorists (Trist, 1982) and now are being adopted in varying degrees by an increasing number of American firms and unions.

NUMMI. Exhibit 3 diagrams interrelationships among the production system in use at NUMMI and in many other Japanese firms. The central feature of this system is its deep dependence on achieving effective performance via the human resource management system. It cannot work unless workers have the proper skills, training, and motivation. Thus, Shimada and MacDuffie argue that achieving and sustaining these human resource outcomes is a necessary condition in order for the just-in-time inventory system, the introduction of quality control into production jobs, the flexible system of work organization, and the related organization design and hardware features of this production system to produce high quality goods at low costs.

While there has been no comprehensive quantitative comparison of the performance of this plant with other auto plants in the U.S., there are enough preliminary quantitative and qualitative data to suggest that it is performing well on quality and cost criteria. It has continued to be evaluated favorably by the workers, union leaders, and managers involved. One study shows, for example, that the plant's productivity and quality performance exceeds the performance levels of a traditionally structured plant with a traditional union-management relationship, and is generally comparable to the quality and productivity levels found in Toyota's major production facility in Japan (Krafcik, 1986). Moreover, UAW and GM management both continue to stress the importance of learning from the NUMMI experiment when introducing new technology and changing work organization practices in other facilities.

Boeing. In 1983 Boeing and the IAM included a New Technology clause in their collective bargaining agreement, which provided for periodic management briefings about plans for new technology, and established a Joint Training Advisory Committee (JTAC) to oversee training and retraining of employees affected by new technology. In the 1986 contract negotiations the parties took another step toward a joint approach to planning for and managing the introduction of technological change, by establishing a Pilot Project on New Technology Committee (PPC). This joint committee is charged with the responsibility of designing, implementing and evaluating experimental projects involving new technology and new work organization arrangements. It represents another example of the use of collective bargaining process to endorse and sanction problem solving and joint planning principles on a project-by-project basis where opportunities for new approaches arise. While it is too early to evaluate this new agreement, it does provide the protective language and the joint commitment needed not only for the initial experiments to be conducted but for the parties to learn from these experiments and to diffuse the experience and knowledge gained from them to other parts of the organization.

The NUMMI experience is made especially significant when compared to the approach to introducing new technology typically followed by American firms. Technology is usually seen as a deterministic factor to be purchased or developed and implemented by management and technical engineering experts. Even companies that emphasize participative principles on a wide range of other issues often fall back into the traditional stance of viewing technology as fixed and relegate organizational and human resource issues to a secondary status (Goodman, 1987). At Boeing, even though considerable progress has been made in giving the union access to information on technology at the strategic level, to date the implementation process at the workplace has followed a fairly traditional form. Labor-management deliberations have focused primarily on the consequences of new technology and not on issues of design. The new technology language introduced in the 1986 labor agreements at Boeing represent the parties' determination to break out of this traditional pattern.

VI. THE ROLE OF EMPLOYMENT SECURITY

The introduction of new technology and changes in work organization are nearly always accompanied by discussions of employment security (Cappelli, 1983). Indeed, as a number of our cases illustrate, parties have used these change events to achieve significant advances in employment security.

Boeing. The joint labor-management training committee set up as part of the new technology language included in the 1983 labor agreement prepared a series of training modules that allowed laid off workers to qualify for jobs created by the new technology. In the past, these new jobs would have gone to new hires.

Boise Cascade. No layoff guarantees were offered by the company in return for acceptance of the wholesale changes in job classifications and work rules even though the changes were achieved by management's dictating the terms of the agreement after taking a long strike. Thus, even in the absence of a cooperative approach to introducing new technology, worker concerns for security are viewed as central to gaining acceptance of the changes.

Xerox. The initial 1983 no layoff agreement for the ACTWU-represented workforce in the Rochester, New York, area came after the introduction of quality circles and after the parties' experience with the wiring harness task force demonstrated the potential of this method for saving jobs from outsourcing.

GM. In 1984 national negotiations GM and the UAW (as well as Ford and the UAW) agreed to establish a jobs bank to protect workers from job loss in the event of

management decisions to outsource work, or to introduce new technologies. Workers whose jobs are eliminated by these decisions are entitled to be retrained for work available either within GM or on the external market.

These experiences illustrate how employment security issues are being handled today as part of the innovation process. While the need to address the employment consequences of new technology has been recognized for some time, these cases allow us to summarize a number of new insights can be drawn from these contemporary experiences.

First, employment security is likely to be addressed when the parties face significant, yet not overwhelming degrees of economic pressure. In some cases in our panel, such as Western, Alcoa, and Budd management interpreted the pressures as being too severe and too persistent to offer or agree to any new formal employment security language. Instead, the effort was to save as many jobs as possible by increasing the chance that the company or the specific site would survive. At the other extreme, in the case of Goodyear, the appearance of a relatively stable market limited the interest of the parties in negotiating comprehensive employment security provisions in return for the incremental reforms achieved in the Lincoln plant.

Second, employment security rarely serves as a starting point for innovation. For example, in 1982 both GM and Ford signed national agreements with the UAW that allowed plants to negotiate Pilot Employment Guarantees at the local level. Employment security would be granted to workers in a plant in return for flexibility in job classification, work systems, and wage payment systems. This new provision generated significant action at only one plant. The employment security incentives were not enough to generate innovation. A similar promise of employment security was not enough to gain acceptance of a new job classification system at Cummins.

Third, in a number of our sites the traditional linkage between employment security and productivity has been reversed. Instead offering employment security to reduce resistance to changes in technology or to other productivity improvement strategies, the parties at Xerox and General Motors made changes to increase productivity in order to save jobs that otherwise would have been outsourced.

VII. THE ROLE OF GAIN SHARING

In a similar way, the introduction of new technology or major work organization reforms eventually raise employee expectations for sharing the gains that are achieved. It is not surprising, therefore, that the issue of gainsharing has come up in union-management discussions at Xerox, Boeing, and Alcoa. The Alcoa case further suggests that expectations for some type of financial return are especially strong where changes in work rules are accompanied by short-run wage concessions. In these cases, it is clear that workers have quite precise estimates of the amount of their wages they have invested in concessions and, therefore, the amount the firm is expected to return to the workforce is the enterprise returns to profitability. Yet despite these expectations, none of the sites studied have yet implemented a formal gain sharing plan (although in two of the cases, GM and Western, profit sharing was agreed to as a quid pro quo for wage concessions). Whether these types of innovations can be sustained over time without affording greater attention to gain sharing or some other contingent compensation arrangement is a question in need of continued study. Our hypothesis is that they cannot.

VII. UNION PARTICIPATION IN STRATEGIC MANAGEMENT DECISIONS

In the examples discussed so far in this report we have focused on changes initiated at either the workplace or the collective bargaining levels of the labor-management relationship. We have followed the extent to which the changes have broadened and deepened the union's role in areas of decision-making that have traditionally been reserved to management. We have also seen how the union's role can be even further circumscribed by unilateral management decisions. One of our central propositions is that broader and deeper union roles at the strategic level of management decision-making are necessary if the innovations in employee participation, work reorganization, and introduction of new technologies and work systems are to be sustained over time. In this section we examine our panel's experiences with explicit agreements to provide a role for union leaders and/or other worker representatives in strategic management decision making processes.

Most of the examples of explicit agreements for worker or union participation in management decision making that have occurred in our panel and throughout North America have originated as quid pro quos in return for wage, work rule, or other concessions or changes negotiated in collective bargaining in response to economic crisis. Moreover, these strategic quid pro quos are mainly found in bargaining relationships in which unions have a strong presence in the organization and where management does not see a viable option for avoiding unions in the future or for meeting its competitive objectives without the sustained support and cooperation of the union(s). These preconditions are not present in the vast majority of contemporary U.S. union-management relationships. As we will see, however, these preconditions for acceptance of a union role at the strategic level are not sufficient for this new role to produce significant benefits to workers and employers. Thus, they are insufficient by themselves to ensure institutionalization.

To be successful and to be sustained over time, we have found that participation at the strategic level must not only help produce tangible economic benefits for the employees and the firm, but must be accompanied by active communications, education, and participation efforts at the workplace level. This is because workers will not support representation or participation in managerial decision-making as a right or a matter of principle. Instead, the majority of workers show little interest in representation at this level of decision making unless and until they see the links between decisions made at this level and their own long-term economic welfare and security, as well as with their every-day work experiences. When these links are made, however, worker interest may well increase, and the probability that support for this type of representation and involvement will be sustained over time may also increase. Our case study at Western Airlines illustrates some of these points.

Western. In collective bargaining in 1983 and again in 1984 the four major unions representing employees at Western Airlines made wage and work rule concessions, and in return were granted (1) four seats on the company's board of directors, (2) a profit sharing plan, and (3) an employee stock ownership plan. These concessions and the quid pro quos were in effect when Western reached an agreement to merge with Delta Airlines in September, 1986. As a result of the merger, Western employees will be absorbed into the Delta workforce. Since only the pilots at Delta are unionized, (and are part of the Air Line Pilots Association, as are the Western pilots), all other employees will lose their

union representation unless their unions can win a representation election involving all of the Delta and Western employees in their respective bargaining units.

Survey data collected from Western employees about one year prior to the merger demonstrated quite clearly that these employees evaluated board representation (and other quid pro quos) primarily on the basis of their economic effects. Exhibit 4 presents the results from a set of questions asking Western employees to indicate which of the quid pro quos they value most: (1) board membership, (2) stock ownership, (3) profit sharing, or (4) employee involvement at the workplace. The clearest result is that all groups value board membership the least of all these options. Employee involvement at the workplace is evaluated more favorably by a large percentage of the respondents in each of the different groups of employees. Profit sharing and stock ownership are valued even higher than employee involvement by all of groups, suggesting that these employees were most interested in using these new compensation arrangements to recover the wage concessions.

The merger with Delta does appear to enhance the security of the jobs of Western employees. In addition, our calculations of the effects of the profit sharing and the stock ownership provisions suggests that the average Western employee will recoup between 75% and 90% of the wage concessions made in 1983 and 1984. At the same time, our case study evidence suggests that the union representatives on the board had little significant influence over the merger negotiations or the terms of the merger agreement, or over other basic strategic business decisions of Western. Thus, this case produced mixed results. The existence of profit sharing and stock ownership did help employees recoup a substantial portion of their economic concessions, while the merger bolster their employment security. However, it is likely that all but one of the unions will lose their representational status in the merger and that all employees will lose representation in strategic management decision making. Thus, in this case involvement in strategic decision making was only a short run quid pro quo that will not be sustained through the change in ownership.

Board representation is only the most visible and formal type of participation in strategic decision making found in our panel. More frequent forms of such participation are ones that evolve incrementally as workplace participation processes expand and top union-management steering committees are established, or as part of work organization reforms, or when decisions to make major new investments or technological changes require agreements between top-level union and management leaders. These opportunities for innovations make it necessary for union and management decision makers to choose between expanding the scope of participation and joint decision-making, and thereby sustaining the innovation process, or limiting its scope and often its momentum. Several examples from the panel illustrate this point.

Examples of involvement in strategic decision-making that evolve incrementally, as expansions of innovations begun at lower levels of the bargaining relationship, include the participation of UAW representatives on the plant manager's steering committee at GM's Fiero

plant, and the participation of ACTWU representatives on Xerox's human resource strategic planning teams and in the design of the work system and cost analysis of the new toner plant. These and other examples noted earlier in this report suggest that the "bottom-up" incremental expansions of participation are more likely than formal provisions for board representation to achieve the types of linkages among workplace, collective bargaining, and strategic interactions that we believe are essential in sustaining strategic level participation.

However, strategic participation represents a fundamental departure from traditional U.S. industrial relations policy and practice. It requires that management accept the union in the organization, and that both parties (and ultimately policy makers) agree on the broader roles of the union. Unless management is prepared to strengthen the role and status of the union, and unless union leaders are prepared to break from their traditional stance of leaving the task of managing to management, strategic participation is unlikely to be initiated or sustained. Because of the important conditions necessary for management and union leaders to accept this innovation, we do not see this type of innovation diffusing to a broad range of settings unless major changes in public policy reinforce changes in the values and strategies of both management and labor. However, we also believe a broader and deeper role for worker representation at this level is absolutely needed to sustain, diffuse, and eventually institutionalize the other innovations discussed in this report.

IX. INSTITUTIONALIZATION OF INNOVATIONS WITHIN THE PANEL SITES

The diversity of situations faced by the parties in the sites studied in this research preclude simple comparisons. Yet we can use the comparative experiences of the cases to summarize a number of the key lessons they offer about the conditions that facilitate institutionalization of changes within bargaining relationships that have initiated innovations. But we must also be careful to avoid over-generalizing from the select and limited sample upon which we have drawn these observations. Therefore, the following summary statements might better be interpreted as hypotheses worth testing in future research or against the personal experiences of labor and management leaders engaged in similar activities.

While we have discussed participation, work reorganization, technological change, employment security commitments, gain sharing, and union participation in strategic management decision-making as discreet starting points for industrial relations innovations, it is clear that none of these can survive over time independent of others. Instead, when combined in ways suited to particular settings, they offer a higher probability of being institutionalized in on-going practices. Indeed, when the full range of innovations discussed here are integrated in a single bargaining relationship, they produce a system of industrial relations that is fundamentally different from the traditional New Deal model.

For example, a major complete transformation of practice has occurred at Xerox and in Fiero and at the other sites in the panel because the parties in these two cases have introduced innovations at all levels of industrial relations that reinforce and help sustain each other. At Xerox participation and problem solving are used not only at the workplace as part of an ongoing QWL process, but to adapt work organization practices, to plan for how to use new technology, to explore opportunities for enhancing employment security, to design a gain sharing system, and for union-management consultation over longer-term plans and business prospects. At Fiero, the principles of participation and flexibility have been integral parts of the overall design and day-to-day management of the facility from the start. Thus, because of the interdependence among these innovations, we believe these parties have gone farther toward a transformation of the overall system of industrial relations governing their relationships and have a higher probability of institutionalizing these innovations as ongoing industrial relations practices.

Throughout this report we have been cautious to not predict a single end point to institutionalization efforts. We know that issues such as work organization, new technology, employment security, gainsharing, and strategic decision making are all related, but we have resisted specifying any single "ideal" relationship for two reasons. First, there is such diversity in practice that no one model suggests itself. Second, we suspect that this diversity may portend the emergence of a model of industrial relations in which various institutional arrangements are in a state of continuing evolution -- driven by an ever evolving product and

labor market context. The result is not the institutionalization of a given employee involvement initiative or joint committee, but rather of certain principles relating to participation, employment security, access to information, and institutional security for unions (where they are present), as well as shared commitments to improving quality, cost, schedule, and flexibility. Further, this evolution is marked by a series of pivotal events or choice points during which these issues are at play.

We only see a continuous commitment to grappling with these issues in a handful of cases. Instead, we mostly observe significant changes in a limited subset of activities. In some cases such as Boeing, Budd, Goodyear, and Alcoa, the parties appear to be searching for strategies to continue the momentum established to date. They are broadening the scope of their innovations in ways needed to reinforce and sustain those already initiated. At Boise Cascade, the changes were introduced as a one-time event, incorporated into the labor contract, and have remained in place. At Cummins there has been a reversal of some of the initial changes as result of conflict that occurred between management and the unions over recent layoffs, recent shifts in business strategy, and changes in top management personnel. Thus, a wide spectrum exists within our panel sites with respect to the degree to which these innovations have been institutionalized and their prospects for further transformation of traditional practices.

X. STRATEGIES FOR DIFFUSION

So far in this report we have focused on the institutionalization of innovations within union-management settings that have initiated innovations during the first half of the 1980s. We have stressed the point that the institutionalization process involves incrementally overcoming or coping with the various internal contradictions that block innovation at all three levels of the labor-management relationship.

However, only a subset of the population of current bargaining relationships across the United States fits this description. Innovation is still concentrated in relationships where the parties have experienced sufficient economic pressures to adapt, and where management lacks

viable alternatives to improving its competitive position without working with the union. Thus, we face a major constraint on the diffusion of these innovations to broader settings, viz, the fact that in the majority of employment relationships in the U.S. management attempts to avoid unionization or to limit the scope and influence of their unions.

We now turn to a discussion of the strategies of American management, union, and government leaders, to identify the factors that will help decide whether these innovations will diffuse, or whether they will remain limited to a relatively small subset of bargaining relationships.

Management Strategies and Choices:

The diffusion of innovations in industrial relations will be vitally affected by the values that govern management policies and by the business and technology strategies management chooses to remain competitive.

Management Values. In unionized settings, innovation depends on management's acceptance of a role for unions at the workplace and in managerial decision-making. This is essential if management is to attain a shared commitment to improving the organization's competitiveness. Yet the opposition to unions and expanded union influence lies so deep within the value system of the majority of American managers that it has become a major barrier to the diffusion of industrial relations innovations.

Efforts to unionize new groups of employees will be highly contested adversarial processes. If the present trends continue, unions will lose a majority of these elections and probably become more frustrated with the current procedures. This will reinforce the insecurity and hostility that has come to characterize the national labor-management climate in recent years. It will make it more difficult for those union leaders who promote innovations and cooperation at the workplace to win internal political battles over these innovations. In those cases where unions do win representation elections, adversarial recognition processes will become adversarial bargaining relationships that will not be conducive to the trust, flexibility, and participative union-management relations required for the institutionalization of innovations.

Thus, American management faces a clear strategic choice: It can continue to take advantage of its current power and influence -- maintaining its traditional opposition to union representation of its workforce. This will make innovation problematic with existing unions. In effect, those managers facing strong, stable unions suffer at the hands of their associates. Alternately, management can join union representatives so as to negotiate various forms worker representation that suit the needs of firms, as well as the needs of unions and the employees/members.

We do not expect a significant shift in managerial values to take place. What we do wish to emphasize here is that collectively, American management has a stake in diffusing innovations. At a macro level, management has an interest in ensuring that actions by any individual management representatives at the level of a firm or a single plant do not chill the environment for innovation in other organizations.

National networks of executives, who have seen the benefits of sustained innovation and who have a significant economic stake in the continuity of these innovations, need to be encouraged along these lines. These executives need to play a visible and active leadership role in promoting discussions over the role of unions in society and the types of union-management relationships that are essential to the long-run competitiveness of American industry. They need to work to educate their peers on the costs of union avoidance to the overall national labor-management climate.

Business Strategies: Not all business strategies are equally compatible with creating and sustaining innovations in industrial relations. The stability provided by collective bargaining under the New Deal industrial relations model rested on the ability of unions to limit management's incentives (or ability) to use labor costs as a major source of competitive advantage. Since collective bargaining is no longer able to "take wages out of ion" in many industries, managers must now compete in settings where labor costs vary. Yet, we believe that attempting to compete through low labor costs is, in the end, not a viable option for much of American industry. This path certainly limits the trust, flexibility, and adaptability of workers that are all needed to sustain the innovations discussed in this report.

ii

American management must recognize that in order to sustain and diffuse innovations over the long-run, it will need to follow competitive strategies that meet the income and employment security expectations of the American workforce. Business and investment strategies that seek to move work in response to short-run variations in labor costs or employment standards are only the most visible of a variety of strategies that are incompatible with sustaining innovation. There will always be environments within or outside the U.S. that offer lower wages and employment standards. This business strategy will forever leave the American workers insecure, and therefore inflexible. Such a short-run strategy will also direct management's attention away from the need to develop the comparative advantage American firms can sustain in the world market, viz., an advantage built on high technology, skilled labor, and flexible production.

Other business strategies that limit trust and flexibility also need to be challenged if innovations are to be diffused. The short-run buying and selling of productive assets as mere financial instruments applied irrespective of employment consequences, has the same chilling effect on trust and flexibility. Thus, corporate take-overs or other investment strategies that have short or limited time horizons have profound dysfunctional human resource and industrial relations consequences.

Technology Strategies. One of the central lessons American management is learning from NUMMI and other Japanese-managed firms in the U.S. concerns the technology strategies these companies are using. Our discussion of NUMMI relied heavily on Shimada's and MacDuffie's model of the production system in use in that plant and in many other Japanese manufacturing firms. The lesson, however, is generalizable to applications of new technology outside of manufacturing as well. That is, technology strategies that rely on effective use of employee motivation, skill, and flexibility are more compatible with innovations in industrial relations than are that try to embody all the controls and labor saving features within the hardware itself. These technologies also help to institutionalize the associated industrial relations innovations discussed in this report.

Strategies and Choices for Union Leaders:

A companion report to this monograph (McKersie, Cutcher-Gershenfeld, and Wever, 1987) provides a detailed analysis of how the strategies and roles of union leaders at the local and national levels change in bargaining relationships that institutionalize these innovations. We therefore need only summarize the key roles of top-level union leaders in diffusing these innovations.

There are deep divisions of opinion within the leadership ranks of the labor movement over whether to support, oppose or remain neutral about many of the innovations discussed here. The American labor movement will very likely experience a prolonged period of internal political debate and conflict over these issues. Unless leaders of national unions and other top-level leaders in the labor movement adopt innovations of this kind as part of their basic strategies for organizing and representing workers, union leaders at lower levels who support these innovations will lose political battles within their unions. Consequently, the diffusion and institutionalization of these innovations will be blocked.

A leadership posture of neutrality or passive acceptance is not enough. This approach would only sustain uncertainty and prolong internal conflict. Moreover, it would leave employers wondering about how supportive future union leaders would be of such changes. Finally, simple passive acceptance would limit labor leaders' ability to shape and influence the course of innovations and would limit the ability of unions to use their support for these ideas in recruiting new union members.

Strategies for Government Officials:

We believe that the broad diffusion of these innovations will require strong and sustained leadership on the part of national political leaders; first, to encourage a positive dialogue between labor and management, and then, to adopt the principles embodied in these innovations as a conscious and explicit national policy. Such a national policy would require comprehensive review and up-dating of both the specific labor laws that govern union-management relations and the array of economic, trade, regulatory, and employment and training policies that influence employment relationship.

Some positive steps in this direction are already being taken at the national and state levels of government and within a variety of public and private groups that are studying ways to enhance the competitiveness of the American economy. For example, the Labor Department recently issued a discussion paper asking for further analysis of the fit between current labor law and the objective of promoting greater cooperation (Schlossberg and Fetter, 1986). This coincides with a growing consensus within the academic community that serious flaws exist in the content and administration of the National Labor Relations Act that impede workers from exercising their rights in union organizing drives and discourage labor and management from adopting many of the innovations discussed in this report (Getman, Goldberg, and Herman, 1976; Dickens, 1983; Freeman and Medoff, 1984; Weiler, 1985; Cooke, 1986; Kochan, Katz, and McKersie, 1986; Morris, 1987). This dialogue must continue and be translated into concrete proposals for updating labor law to fit the contemporary environment.

The efforts of the Labor Department's Bureau of Labor Management Relations and Cooperative Programs to promote research and disseminate information on innovations in industrial relations have also helped to bring the changes in industrial relations practices to a broad range of practitioners. As mentioned earlier in this report, the network established through the Labor Department's support of this research has served a diffusing role as the parties interacted and learned from each other's experiences. The development of more and larger networks such as these should continue to pay dividends for the Labor Department and the economy.

Updating labor policy will also require greater integration of labor-management relations with other dimensions of our national human resource and economic policies. In this monograph we have emphasized the importance of cooperation, flexibility in human resource management, compensation and employment security, and long run business strategies within individual firms. The same need exists for coordination and integration of public policies affecting these activities and outcomes. The recent report of the Secretary of Labor's Task Force on Economic Adjustment and Work Dislocation is a good example of a tripartite effort to reach a consensus on a national policy for helping workers and firms adjust to economic

and technological changes. The involvement of labor, business, and government representatives in the development of this policy not only helped to build a stronger link between public policy and private practice but it also served as a model for making progress on a controversial labor policy issue--by involving the parties in intensive negotiations and consensus building.

There is also an opportunity to take advantage of the growing consensus among public officials, business and labor leaders, and academic experts on the need to develop a long-run strategy for improving the competitiveness of American firms in world markets and reducing our trade deficits. We believe that diffusing and institutionalizing the industrial relations innovations discussed in this report will be critical to the success of these efforts and should, therefore, be integrated into these strategy discussions.

We can make this final point by way of a historical analogy. Collective bargaining only diffused and became institutionalized as a stable institution in American society after the private experiments of unions and employers in the clothing, skilled trades, railroad, and other industries were adopted as the basic public policy of this country in the Railway Labor Act and the Wagner Act. The diffusion of collective bargaining was then bolstered with the support of the National Labor Relations Board and the War Labor Board. Macro economic policies that linked economic expansion and improved standards of living further assured the centrality of collective bargaining. Public policy will need to play a similar institutionalizing role if the innovative practices that management and labor have experimented with in selected private settings during the first half of the 1980s are to be sustained and diffused to broader settings in the years ahead.

References

- Cappelli, P. and R. McKersie**
1987 "Strategic Choice and the Control of Labor Costs" Alfred P. Sloan School of Management Working Paper #1865-87.
- Cappelli, P.**
1983 "Union Gains Under Concession Bargaining" in IRRA Proceedings, 36th Annual Conference, B. Dennis, Ed. Madison, WI: IRRA.
- Cooke, W.**
1985 "The Failure to Negotiate First Contracts: Determinants and Policy Implications," in Industrial and Labor Relations Review, Vol. 38, No. 2.
- Cutcher-Gershenfeld, J.**
1986 "A Workforce Divided: Theoretical and Practical Implications of In-Groups and Out-Groups in QWL Initiatives," Mimeo.
- Cutcher-Gershenfeld, J., R. McKersie, and K. Wever**
1987 "The Changing Role of Union Leaders." Washington, D.C.: U.S. Department of Labor.
- Dickens, W. and J. Leonard**
1985 "Accounting for the Decline in Union Membership," Industrial and Labor Relations Review, Vol. 38, No. 3.
- Dickens, W.**
1983 "The Effect of Company Campaigns on Certification Elections: Law and Reality Once Again," in Industrial and Labor Relations Review, Vol. 36, No. 4.
- Farber, H.**
1985 "The Extent of Unionization in the United States," in Challenges and Choices Facing American Labor, T. Kochan, ed. Cambridge: MIT Press.
- Freeman, R. and J. Medoff**
1984 What Do Unions Do? New York: Basic Books, Inc.
- Gettman J., S. Goldberg and J. Herman**
1976 Union Representation Elections: Law and Reality. New York: Russell Sage Foundation.
- Goodman, P. and Associates**
1987 Designing Effective Work Groups. New York: Josse-Bass.
- Hackman, J. and G. Oldham**
1980 Work Redesign. Reading, MA: Addison-Wesley.
- Hulin C. and Blood, M.**
1968 "Job Enlargement, Individual Differences, and Worker Responses," Psychological Bulletin 69.
- Kochan, T., H. Katz, and R. McKersie**
1986 The Transformation of U.S. Industrial Relations. New York: Basic Books, Inc.
- Krafcik, J.**
1986 "Learning from NUMI," Mimeo.

- Lewin, K.**
1948 Resolving Social Conflict: Selected Papers on Group Dynamics. New York: Harper.
- Morris, C.**
1987 American Labor Policy. Washington, D.C.: Bureau of National Affairs.
- Pava, C.**
1985 "Managing New Information Technology: Design or Default?" in HRM Trends and Challenges, R. Walton and P. Lawrence, eds., Boston: Harvard Business School Press.
- Schlossberg, S. and S. Fetter**
1986 "U.S. Labor Law and the Future of Labor-Management Cooperation." Washington, D.C.: U.S. Department of Labor.
- Shimada, H.**
1986 "Japanese Industrial Relations in Transition," Alfred P. Sloan School of Management Working Paper # 1854-87.
- Shimada, H. and J. MacDuffie**
1987 "Industrial Relations and 'Humanware,'" Alfred P. Sloan School of Management Working Paper # 1855-87.
- Trist, E.**
1982 "The Evolution of Socio-Technical Systems," Toronto: Ontario Quality of Working Life Centre.
- Turner A. and P. Lawrence**
1965 Industrial Jobs and the Worker: An Investigation of Response to Task Attributes. Boston: Harvard University Graduate School of Business Administration.
- Verma, A. and R. McKersie**
1987 "Employee Involvement: The Implications of Non-Involvement by Unions," The Industrial and Labor Relations Review (Forthcoming).
- Walton, R.**
In Press Innovating to Compete. [Need full citation]
- Walton, R.**
1983 "New Technology and its Workforce Implications: Union and Management Approaches," Harvard University Graduate School of Business Administration Working Paper 84-13.
- Walton, R.**
1980 "Establishing and Maintaining High Commitment Work Systems," in The Organizational Life Cycle, J. Kimberly and R. Miles, eds. San Francisco: Jossey-Bass.
- Walton, R. and R. McKersie**
1965 A Behavioral Theory of Labor Negotiations. New York: McGraw Hill, Inc.
- Weiler, P.**
1984 "Striking a New Balance: Freedom of Contract and the Prospects for Union Representation," Harvard Law Review, Vol. 98, No. 2.

Exhibit I

The Three Tiers of Industrial Relations Activity

We use a three tier model to describe both the key principles in the New Deal industrial relations system and the efforts of labor and management to move to a new system. The focal point of the New Deal system was the middle tier, i.e., the level at which unions and employers negotiated collective bargaining agreements over wages, hours, and working conditions. The key to the success of this model was that collective bargaining "took wages out of ion." At the top tier of the system the principle that it was management's sole job or prerogative to manage the enterprise; unions and workers were to negotiate over the impacts of strategic management decisions if these decisions affected wages, hours, or working conditions. At the bottom tier, the workplace, the collective bargaining agreement specified in detail worker rights and obligations and provided workers a voice in day-to-day administration through the grievance procedure. As we will see, the innovations underway in the 1980s challenge each of these New Deal principles and practices.

At the workplace, for example, efforts are underway in many settings to introduce more employee participation and greater flexibility in the organization of work and utilization of people. At the level of collective bargaining, negotiations continue to play an important role. However, the inability of unions to take wages out of competition by standardizing wages and benefits across the product market has forced the parties to give greater attention to employment issues and in some cases to experiment with new wage criteria and formulas that link wage increases to more firm-specific performance. Innovations underway at the level of strategic decision-making, stand in direct contrast with the New Deal principles regarding managerial prerogatives. In a limited number of settings management and union leaders are experimenting with different ways to involve earlier and more deeply union leaders in decisions that heretofore would have been the sole province of management.

Exhibit 2

Overview of Research Sites

	Workplace Level	Collective Bargaining Level	Strategic Level
GM-UAW (Fiero & Lake Orion plants -- both MI)	Elements of the team system, Less supervision, Heightened emphasis on quality control Fewer inventories allowing for employees to choose single or multiple classification pay and work organization	Departures from past practice to allow greater flexibility in work design & wages Lake Orion agreement roles in Fiero	Joint discussion of new technology, human resource planning, and some aspects of investment at Fiero Formal top-level joint
Xerox-ACTWU (Rochester, N.Y. manufacturing complex)	Highly evolved employee involvement groups, Some autonomous work groups, Less supervision, Statistical process control, Areas of complete work redesign Just in time delivery Reduced inventories out of base wage Shelter agreements to allow for flexible work organization	No-layoff guarantee, Language guaranteeing joint decisions on outsourcing, Experimental gainsharing program, Problem-solving approach to bargaining Shift in pay to take some increases contractors	Joint decision-making on subcontracting, Horizon teams for long-term joint human resource planning, Regular union access to CEO, Joint plant design, Joint new product development New relations with sub-

Exhibit 2 (Continued)

Overview of Research Sites

	Workplace Level	Collective Bargaining Level	Strategic Level
Western-ALPA, IBT, ATE, AFA (Los Angeles main hub)	Limited employee involvement	Deep concessions in wages and work rules	Union seats on the board of directors Minority employee stock ownership
Boeing-IBT (Seattle, WA manufacturing complex)	Quality circle program	New technology language covering training, information sharing, and pilot programs and experiments	Joint union-management pilot technology programs and experiments
Budd-UAW (Detroit, MI and Kitchener, Ontario manufacturing plants)	Employee involvement groups Statistical process control Just-in-time delivery being established Joint Die Transfer committee	Substantial wage and benefit concessions History of wild cat strikes and other concerted activity	Establishment of joint, top-level steering committee
Cummins-DWU, OCU (Columbus, OH)	Work redesign, Extensive employee involvement program Statistical process control	Some wage concessions Limited job security	Unanticipated corporate-wide layoff

Exhibit 2 (Continued)

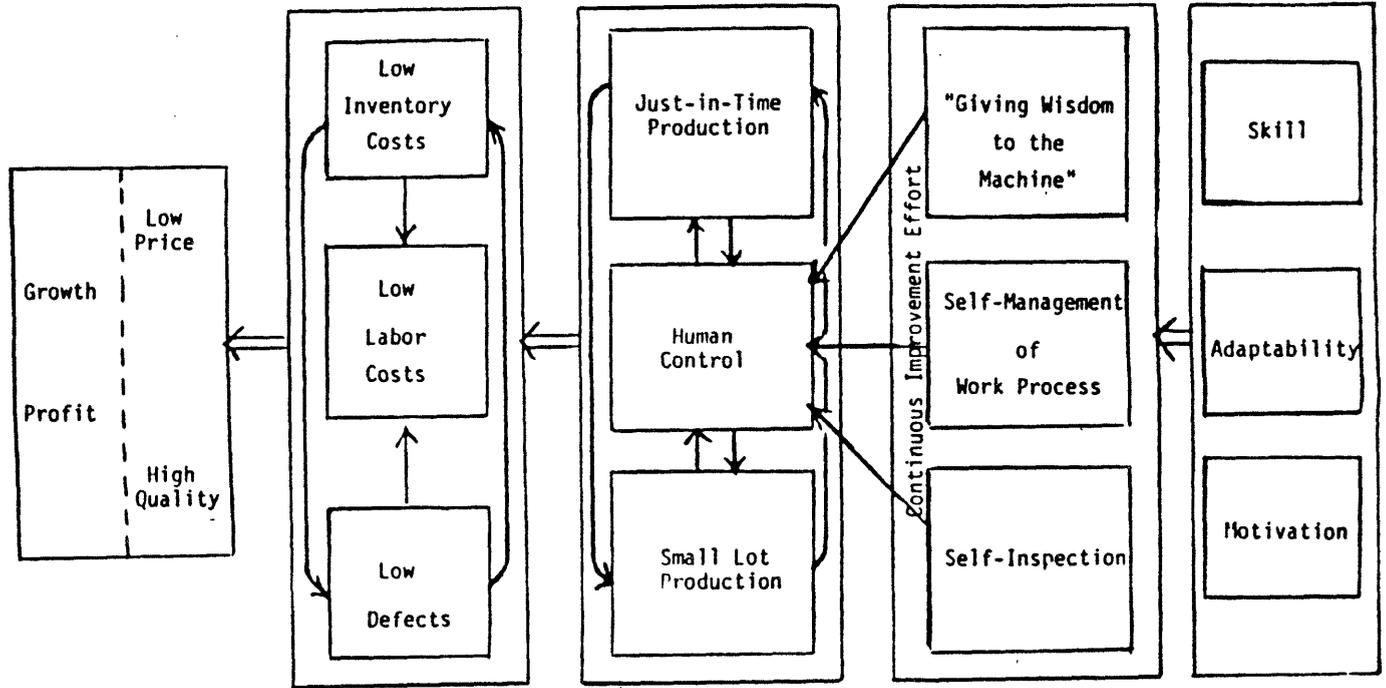
Overview of Research Sites

	Workplace Level	Collective Bargaining Level	Strategic Level
Alcoa-ABGWU (Lebanon, Pa rolling mill)	Employee involvement and commun- ications programs, Selected areas with work re- design and autonomous work group Statistical process control	Substantial wage and benefit concessions Inability to depart from national agreement on gainsharing	
Boise Cascade- PWU (Deridder, LA paper mill)	Sudden shift to highly flexible work organi- zation with only four job classifications	Complete replacement of traditional contract with team-based system of work organization Lengthy strike prior to the change	
Goodyear-URW (Lincoln, NE manufacturing plant)	Employee involvement and communications programs, Statistical process control	Problem-solving negotiations process	

Exhibit 3

Japanese Production Systems

'HUMANWARE:' THE JAPANESE MODEL



Corporate Goals	Production System Outcomes	Key Features of Production System	Human Resource Integration with Production System	Human Resource Effectiveness
-----------------	----------------------------	-----------------------------------	---	------------------------------

Exhibit 4

**Preferences Among "Quid Pro Quos" of
Western Airlines Employees in Four Unions**

(Forced Choice Comparisons; 1986 Survey)

	ALPA (n = 72)	IBT (n = 122)	AFA (n = 156)	ATE (n = 207)
Percentage of Members Preferring Profit Sharing Over Board Representation	78%	88%	75%	87%
Percentage of Members Preferring Stock Ownership Over Board Representation	83%	78%	72%	82%
Percentage of Members Preferring Profit Sharing Over Employee Involvement	70%	70%	68%	74%
Percentage of Members Preferring Employee Involvement Over Stock Ownership	40%	50%	50%	42%
Percentage of Members Preferring Stock Ownership Over Profit Sharing	49%	30%	25%	28%
Percentage of Members Preferring Board Representation Over Employee Involvement	40%	16%	31%	25%

ALPA = Airline Pilots Association
IBT = International Brotherhood of Teamsters
AFA = Airline Flight Attendants
ATE = Air Transport Employees