Appendix B
Industrial Relations

Overview

The activities, institutions, and circumstances of industrial, or labor-management, relations influence the implementation of new technology and its consequences within firms and industries. In particular, they contribute to employment patterns and workplace conditions that might not arise with technology change and market forces alone. Therefore, an understanding of industrial relations is necessary for understanding not only how programmable automation may affect company and industry employment and wage levels; but also how job content, promotion paths, and workplace conditions may change with programmable automation; and why employees and management in different companies and industries may have different experiences with technological change.

Despite the important role of industrial relations in the U.S. economy, the analysis of industrial relations tends to be relatively imprecise and experiential. As one participant in the OTA Labor Markets and Industrial Relations Workshop put it, there seem to be more "ad hoc-cries" than true theories for explaining industrial relations phenomena. Further complicating an evaluation of industrial relations issues are the differences in approach taken by different analysts. For example, most labor economists and so-called industrial relationists tend to regard workers and managers as having opposing interests, with workers striving to minimize work effort and maximize compensation, and managers striving to minimize cost and maximize production. Most organizational behaviorists and organizational development specialists tend, by contrast, to regard workers and managers as sharing basically similar interests that stem from their association with the same organizations. The former group tends to focus on the setting of wages and other "economic" issues, while the latter group tends to focus on job satisfaction and performance, supervisory relationships, and job design. *

A final, but critical, factor complicating attempts at precise analysis of industrial relations issues is the fact that rhetoric that tends to exaggerate conflict between labor and management can obscure the actual circumstances of industrial relations, particularly in unionized settings. According to some observers, rhetorical hostility between organized labor and management has been especially high during the last few years:

> . . . (W)e are witnessing a continuation of this recent **high level of rhetorical hostility between labor and management compared to the situation that prevailed during most of the 1950-80 period.** In addition, . . . the one-sidedness of our (and the traditional) definition of conflict as ***worker*** action shows a tendency to obfuscate the reality of conflict between managers and workers, for it leads us to reject aggressive action by management.[2]

This rhetoric, amplified by the news media in the context of deteriorating economic conditions, may bias public opinion against organized labor, despite the lack of objective analysis of the contributions of both labor and management activities to current economic conditions.

The popular, and even the research, view of industrial relations tends to focus on unionized settings, since unions (and employee associations that function similarly) serve to focus and articulate the concerns of workers both at the workplace and in the community, although only a portion of U.S. companies and workers are unionized. The union-nonunion distinction is misleading, however, because labor-management relations fall into a spectrum that includes intermediate arrangements containing greater and lesser numbers of pure union-like and nonunion-like attributes. The principal difference between the union and the nonunion setting is that in the nonunion setting, management typically imposes job descriptions, wage levels, working conditions, and technological change unilaterally, while in the union setting, many of the terms of the workplace are jointly set by labor and management through a negotiation process. Therefore, the role or conduct of labor is as important as that of management in the unionized setting.

Unions are of particular, but not exclusive, interest to a study of the impacts of programmable automation because workers in many of the occupations and industries where programmable automation is expected to have the greatest impacts are especially likely to belong to unions. Unions whose members will be exposed to programmable automation include those representing workers in metalworking manufacturing industries, such as the United Auto Workers, the International Association of Machinists (IAM), the International Brotherhood of Electrical Workers, and others that are listed in a paper by W. Cooke, appen-

[1] Peter Feuille and Hoyt N. Wheeler, "Will the Real Industrial Conflict Please Stand Up?" in *U.S. industrial Relations 1950-1980: A Critical Assessment*, Jack Steiber, et al. (eds.) (Madison, Wis.: Industrial Relations Research Association 1981).

[2] Ibid.

dix C. Although the median size for national unions is around 25,000 members, several unions representing manufacturing workers are among the largest, with memberships between 100,000 and 1.5 million.[3] See table B-1. While unions may influence the adoption of programmable automation and its impacts on their members, the adoption of programmable automation may in turn affect the strengths and abilities of unions insofar as job content, numbers of different types of workers, wage levels, and job satisfaction levels change. How unions change as programmable automation is adopted has implications for both the spread of automation and the characteristics of industrial relations.

In addition to unions, and to the various entities that influence labor-management relations in unionized settings (e.g., the National Labor Relations Board, the Federal Mediation and Conciliation Service, arbitrators, and the courts), there are other institutions that shape industrial relations in both unionized and nonunionized settings and that may influence the adoption of programmable automation and its impacts. These include labor-management committees (instituted in both unionized and nonunionized settings), and government regulatory agencies such as the Occupational Safety and Health Administration and the Equal Employment Opportunity Commission.

The remainder of this section will provide a brief description of the collective bargaining process and outline some of the issues facing labor organizations and management in the context of the spread of programmable automation. Union and management attitudes and practices regarding education and training and working environment issues are addressed elsewhere in this report. Industrial relations in nonunion settings is not addressed in this technical memorandum.

Legal/Regulatory Framework

The central feature of labor-management relations in the unionized setting is collective bargaining, the process of negotiating the terms and conditions of work that will be codified in a contract that may apply for a period of 1 to 3 or more years. Guidelines for collective bargaining governing the processes of unionization and selection of worker representatives, procedures for bargaining and resolving disputes, and

[3] U. S. Bureau of Labor Statistics, *Directory of National Unions and Employee Associations,* 1980.

Table B-1 .—National Unions and Employee Associations Reporting 100,000 Members or More, 1978[a]

Organization[b]	Members (in thousands)	Organization[b]	Members (in thousands)
Unions:		Unions:—Continued	
Teamsters (Ind.) ... ,	1,924	Government (NAGE) (Ind.)	200
Automobile Workers (Ind.)	1,499	Railway Clerks	200
Steelworkers	1,286	Rubber	200
State, County	1,020	Retail, Wholesale	198
Electrical (IBEW)	1,012	Painters	190
Machinists	921	Oil, Chemical	180
Carpenters	769	Fire Fighters	176
Retail Clerks	736	Transportation Union	176
Service Employees	625	Iron Workers	175
Laborers	610	Bakery, Confectionery, Tobacco	167
Communications Workers	508	Electrical (UE) (Ind.)	166
Clothing and Textile Workers	501	Sheet Metal	159
Meat Cutters	500	Transit Union	154
Teachers	500	Boilermakers	146
Operating Engineers	412	Transport Workers	130
Hotel	404	Printing and Graphic	120
Ladies' Garment	348	Maintenance of Way	119
Plumbers	337	Woodworkers	118
Musicians	330	Office	105
Mine Workers (Ind.)	308	Associations:	
Paperworkers	284	National Education Association	1,696
Government (AFGE)	266	Nurses Association	187
Electrical (IUE)	255	Classified School Employees	150
Postal Workers	246	Police	140
Letter Carriers	227	California	105

[a] Based on reports t. the Bureau. All unions not identified as (Ind.) are affiliated with the AFL-CIO.
[b] For mergers and changes since 1978, see app. A.

SOURCE: U.S. Department of Labor, "Directory of National Unions and Employee Associations, 1979."

the sanctioning of unfair labor practices on the part of both management and labor, are found in several pieces of Federal legislation: 1) the National Labor Relations Act (Wagner Act / NLRA) of 1935, which established the National Labor Relations Board (NLRB) for labor practices rulemaking, investigation, and dispute-adjudication; and 2) its amendments promulgated in 1947 (Taft-Hartley Act) and 1959 (Landrum-Griffin Act).[4] The statutory framework for collective bargaining has remained unchanged since 1959, although attempts at legal reform were made unsuccessfully in the late 1970's.

Labor contracts can have enormous influence on how programmable automation affects existing and future workers in unionized firms. What kind of influence they have depends on what is included in the contracts, how the contracts are administered, and how NLRB, arbitrators, and courts interpret provisions subject to dispute.

The NLRA established that "wages, hours, and other terms and conditions of employment" constitute mandatory bargaining material. NLRB has interpreted this provision to mean that labor and management may negotiate over issues in two categories, one category of issues for which bargaining is mandatory, and one category of issues for which bargaining is permissible but not mandatory. NLRB and court rulings on the adoption of (conventional) automation through the 1970's generally imposed a requirement to bargain as to the effects of automation on workers, but not on the decision of whether and when to introduce automation.

Automation and the Law

Past NLRB and court rulings have generally treated the decision to automate as protected by "managerial rights" established in labor contracts. The breadth of the managerial rights protection depends on the language of the contract and its interpretation, given management's other obligations. Managerial rights have been construed to apply (in the absence of proven anti-union conduct) to the control of the production process, including the making of changes in property, plant, and equipment associated with production. Although changes in property, plant, and equipment can affect the terms and conditions of employment, and can, especially in the long term, lead to reductions in company employment levels, NLRB rulings to date imply that employers need not bargain where new technology "does not deprive employees of jobs, work opportunities, or otherwise cause a real change in working conditions" immediately.[5] Similarly, arbitration rulings regarding the interpretation of existing contracts suggest that management is accorded broad discretion for implementing new technology, altering work rules, and reallocating work between employees in the bargaining unit and others as a result of technological change, in the absence of specific contract language governing such changes.'

Both the language of NLRA and past rulings of NLRB and the courts leave unanswered many questions regarding the scope and timing of bargaining to which an employer is obligated regarding the adoption of new technology in general and programmable automation in particular.[7] Consequently, in the absence of new legislation, the development of clearer standards for collective bargaining regarding programmable automation would appear to await the passage of time and the development of precedents through NLRB and court rulings. The development of precedent, in turn, will depend in part on the changing membership of the NLRB which is comprised of presidential appointees serving 5-year terms.[8] Additional discussion of the role of NLRB may be found in a paper by W. Cooke, appendix C.

Contract Language

Existing contracts vary greatly in the degree to which they can influence the adoption of programmable automation or its effects. The substantive focus of most labor contracts has historically been on such matters as wages and hours, work rules and labor grades, and procedures for grievance resolution. Indeed, a government survey of labor contracts covering at least 1,000 workers **that** were in effect at the beginning of 1980 indicates concern over only one issue directly relevant to the adoption of programmable automation —advance notice of technological change. See table B-2. The general lack of specificity of past contracts with respect to technological change suggests that most unionized workers are preoccupied with the so-called bread and butter" issues of wages and hours and that they may accept management's responsibility to make and implement decisions necessary to keep the company financially healthy and competitive—except, perhaps, where those decisions can be clearly linked to threats to job security. The infrequency of specific language regarding technological change may also reflect a lack of appreciation on the part of workers of how technological change may affect employment

[4] 29 U. SC. sec. 151-167 (1964).

[5] Joseph Manners, "New Technology and the Law, " notes for remarks presented at IAM Electronics and New Technology Conference, Sept. 21, 1982.

[6] Doris B. McLaughlin, 'The Impact of Labor Unions on the Rate and Direction of Technological Innovation," report prepared for the National Science Foundation (Detroit, Mich.: Wayne State University, Institute of Labor and Industrial Relations, 1979); and Manners, op. cit.

[7] "Notes: Automation and Collective Bargaining," *Harvard Law Review, 84,* 1971.

[8] Robert S. Greenberger, "Reagan NLRB Tilts Toward Management, " *Wall Street Journal,* Aug. 2, 1982.

Table B.2.—Major Collective Bargaining Agreements Advance Notice Provisions by Industry
(agreements covering 1,000 workers or more, January 1, 1980)

Industry	All agreements		Requiring advance notice: Total		Layoff		Plant shutdown or relocation		Technological change	
	Agreements	Workers	Agreements	Workers	Agreements	Workers	Agreements	Workers	Agreements	Workers
All Industries	1.550	6,593,800	796	3,689,100	682	2,986,700			162	1,201,650
Manufacturing	750	3,025,150	499	2,202,350	431	1,756,750	108	504.950	81	713,950
Food, kindred products	79	234,200	45	159,900	36	80,000	14	89;900	12	32;650
Tobacco manufacturing	8	21,800	8	21,800	5	16,100	6	11,800	—	—
Textile mill products	11	26,850	7	21,000	2	2,300	1	5,000	6	19,800
Apparel	31	207,900	11	118,000	2	6,200	2	18,200	8	96,800
Lumber, wood products	11	17,100	4	6,700	4	6,700	1	l,500	—	—
Furniture, fixtures	17	23,100		13,100	9	10,800	2	2,300	—	—
Paper, allied products	42	85,000	11	34,900	10	17,950	9	15,250	9	17,100
Printing and publishing	15	31,800	14	30,800	12	28,400	3	3,300	9	24,S00
Chemicals	36	61,700	25	36,850	23	34,450	2	3,800	5	9,000
Petroleum refining	15	25,500	9	15,500	8	13,000	6	11,800	1	1,700
Rubber and plastics	14	68,850	12	52,500	9	20,250	4	34,050	2	23,450
Leather products	11	23,100	5	9,750	3	6,300	1	1,100	2	3,450
Stone, clay, and glass	35	93,600	28	63,050	21	67,750	15	51,150	7	17,350
Primary metals	88	460,800	48	193,600	43	128,550	7	75,850	3	8,800
Fabricated metals	41	97,000	35	67,150	32	79,750	6	11,800	—	—
Nonelctrician machinery	81	242,150	85	212,100	84	210,900l	11	50,150	7	12,650
Electrical machinery	63	323,750	81	259,850	59	188,300	10	99,700		9,000
Transportation equipment	112	957,100	76	810,150	74	807,200	5	13,550	:	437,400
Instruments	11	27,850	11	27,850	11	27,650	3	5,550	—	—
Miscellaneous manufacturing	9	14,800	4	6,200	4	6,200	—	—	—	—
Nonmanufacturing	800	3,588,850	297	1,488,750	251	1,229,950	42	204,250	61	487,700
Mining, crude petroleum, and natural gas	16	189,050	6	148,200	4	133,200	—	—	3	140,000
Transportation[a]	62	489,550	24	128,800	16	56,950	10	78.950	5	23,650
Communications	80	620,000	63	492,450	61	463,650	3	16,250	7	67,450
Utilities, electric, and gas	81	210,700	53	155,800	50	135,350	2	3,750	9	36,450
Wholesale trade	12	23,900	8	18,250	5	11,200	1	1,550	2	5,500
Retail trade	123	405,200	82	304,450	84	226,500	17	48,000	43	148,950
Hotels and restaurants	31	148,300	12	51,050	10	32,250	1	1,000	3	21,750
Services	88	323,450	26	115,800	22	08,150	5	31,500	9	45,950
Construction	327	1,195,000	21	72,354)	19	54,700	3	21,250	—	—
Miscellaneous nonmanufacturing	2	3.500	—	—	—	—	—	—	—	—

NOTE: Nonadditive.
[a] Excludes railroads and airlines.

SOURCE: U.S. Department of Labor, "Characteristics of Major Collective Bargaining Agreements, January 1, 1980," May 1961.

and working conditions, and/or an inability of unions to negotiate successfully for such language.

Overall, the scope of labor contracts began to expand beyond traditional provisions in the 1960's in response to technological change, growth in foreign competition, and growth in the practice of subcontracting work to both domestic, and particularly foreign, firms. Clauses in the following areas, which may be relevant to the adoption of programmable automation, have become more common during the past two decades:

- ***Job* and Wage Security.** Retraining (for whom, who pays); layoff, transfer, and relocation procedures; "red-circling''(maintenance) of wages of persons transferred to lower paying jobs; severance payments; early retirement.
- Technology ***Change.*** Advance notice; consultation; establishment of labor-management advisory committees.

In 1966 the Automation Commission endorsed the practice of advance notice of technological change as a measure that the private sector could take to facilitate adjustments in the labor market, together with explicit advance planning by companies for attrition and other internal work force adjustments. g A comparison of contract scope in the mid-1960's and the early 1980's is provided in a paper by M. Roberts, appendix C.

Additional areas for labor contract change in connection with programmable automation include modification of work hours (currently included in some contracts as a means of adapting to periods of slack business), specific triggers for reopening negotiations before contracts formally expire, procedures for reclassifying workers, definition of and assignment of work to the bargaining unit, and involvement of labor representatives in planning, design, and purchase decisions for automated systems. Whether, when, and how labor contracts accommodate the adoption of automation will depend on many factors, such as the duration of the current concessionary bargaining trend and the weight given to technological **change relative to other concerns by both labor and management. IAM, for example, appears to attach great weight to tech-**

[9] *Technology and the American Economy, report* **of the U.S.** National Commission on Technology, Automation, and Economic Progress, February 1980.

nological change, especially automation, as a bargaining issue; it has included technological change provisions in model contract language it has developed since the 1960's. In 1982, two IAM locals engaged in long-term strikes over proposed work-rule changes associated with programmable automation.[10]

A key question with regard to the impacts of programmable automation on industrial relations among unionized firms is whether the collective bargaining framework is adequate for meeting needs of both labor and management with respect to programmable automation. At this time, there does not appear to be empirical data suitable for evaluating how programmable automation may affect industrial relations, and vice versa. Participants in the OTA Labor Markets and Industrial Relations Workshop appeared to agree that collective bargaining can accommodate new needs associated with programmable automation, although some participants maintained that the resiliency of collective bargaining depends in part on how the relative bargaining power of unions and management changes in response to new technology and to other factors. A discussion of relative bargaining power is provided in a paper by W. Cooke, appendix C.

[10]Marilyn Chase, "Work Rule Changes Sought," *American Metal Market/Metalworking News,* Oct. 25, 1982.

Institutional Change

The overall bargaining power of unions relative to management and the overall role played by unions in the transition to new manufacturing technologies, including programmable automation, depend on the extent of union representation and on the response of unions to specific aspects of programmable automation (and other new technologies). Factors influencing union representation and union responses to new technology are outlined below.

Union representation is largely a function of numerical strength. Changes in the numerical strength of the labor movement as a whole are widely acknowledged. Although membership in labor organizations has grown, the proportion of the labor force that is organized and the rate of growth of union membership have both declined during recent decades, and unions have been less successful in arranging and winning elections. Moreover, unions have become less successful in overcoming recertification efforts in the past few years. See figure B-1.

Factors Influencing Union Representation

The erosion of overall union representation has been attributed to many factors, including changes in em-

Figure B-1.—Change in Union Representation Over Time

Chart 1. **Membership of national unions, 1930-78**[a]

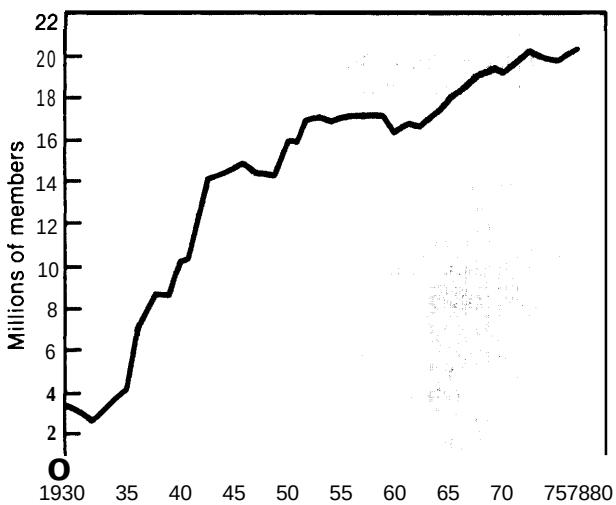
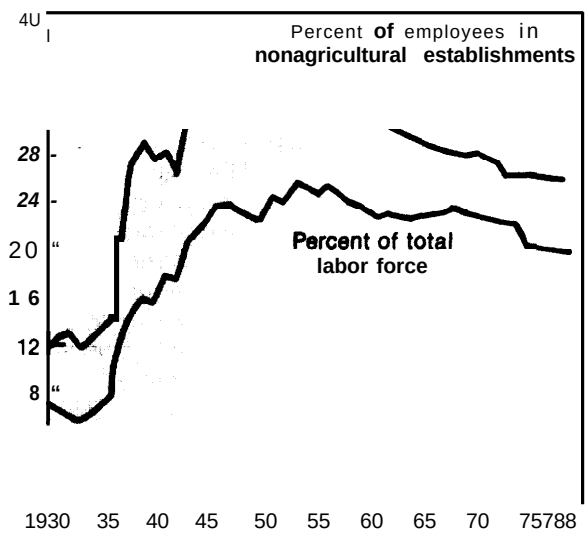


Chart 3. Union membership as a percent of total labor force and of employees in nonagricultural establishments, 1930-78[a]



[a]Excludes Canadian membership but includes members in other areas outside the United States. Members of AFL-CIO directly affiliated local unions are also included. Members of single-firm and local unaffiliated unions are excluded. For the years 194&52, midpoints of membership estimates which were expressed as ranges were used.

SOURCE. U.S Department of Labor, "Directory of National Unions and Employee Associations, 1979."

ployer practices (as a factor enhancing employer effectiveness in avoiding unionization), relocation of production, structural change in the economy, and proliferation of new parties to industrial relations activities. It is uncertain, however, whether the overall economic strength of unions has declined commensurately.

Modern personnel practices may diminish the incentive of workers to organize where management provides grievance procedures, complaint channels, company information, fair compensation, and other services or benefits that unions have been instrumental in launching at unionized firms. Personnel practices have improved as a result of growth in government regulation of employment conditions, growth in business school training of managers, increased attention of business school curricula to human resource management, and other factors.[11] One industrial relations analyst relates change in employer practices to the spread among managers of the view that "unions exist as a reflection of management failures, " although he notes that such generalizations tend to be unmerited, reflecting doctrine rather than analysis of specific situations. 1[2] A review of the industrial relations literature shows that this characterization appears to be accepted by many academic observers of industrial relations trends.

The shift in location of production from unionized to nonunionized regions in the United States, and from the United States to other countries, has also diminished the union presence in the workplace. Locational shifts occur for many reasons, most related to costs, and in some cases including a desire by management to evade unions.[13] Where locational shifts involve plant closings, unions can gain political support through community opposition to closings. * On the other hand, management develops political support (though not necessarily at the local level) by relating locational and other decisions to business strategy for maintaining competitiveness. Although "competitiveness" has become a battle cry in rhetorical wars between unions and employers, the true extent of the effect of unions on industrial competitiveness, and the soundness of that rationale for relocating production facilities away from unionized areas, are uncertain.

Another important factor in observed erosion of union representation is structural change in the economy. In brief, growth in service industry relative to manufacturing employment, and growth of public sector relative to private sector employment have increased the proportion of employment opportunities in occupations and industries with traditionally limited union representation. See figure B-2. Moreover, growth in electronics and other so-called "high tech" industries which have little union representation relative to traditional manufacturing has also reduced the proportion of employment in unionized industries (although unionized, traditional manufacturing industries employ more people than high-tech industries). * The continuation of these divisions between predominantly union and nonunion industries and sectors is uncertain.

Finally, several new parties have entered the industrial relations arena in the past two to three decades. First, the use of consultants who specialize in personnel management and in combating unions and the establishment of labor-management committees have grown among both unionized and nonunionized firms. ** Although the legality of labor-management committees in unionized firms has been questioned (as possibly unfair employer interference in the bargaining process), and although some unions regard committees as conflicting with the bargaining process, many committees have been established through collective bargaining, and legal problems are being resolved. * * * The long-term impacts of labor-manage-

[11] D. Quinn Mills, "Management Performance, " and Fred K. Foulkes, "Large Non Unionized Employers," in U.S. *Industrial Relations 1950-1980: A Critical Assessment,* Jack Steiber, et al. (eds.) (Madison, Wis.: Industrial Relations Research Association, 1981).

[12] Ibid.

[13] Ibid.

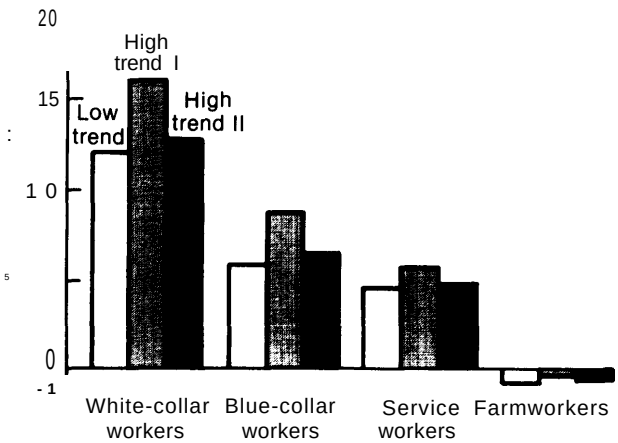
● Point debated in 1982 OTA Labor Markets and Industrial Relations Workshop.

● A BLS analysis conducted for the Joint Economic Committee notes that high-tech industries account for 4.6 percent of total wage and salary employment. By contrast, all manufacturing industry wage and salary jobs comprise about 22 percent of the total.

' ● This point was raised at the OTA Labor Market and Industrial Relations Workshop and in a roundtable reported in *Fortune* magazine, Sept. 20, 1982.

● **Point discussed at the OTA Labor Market and Industrial Relations Workshop.

Figure B-2.—Job Growth for Major Occupational Categories Under Alternative Economic Projections, 1978-90



SOURCE: Bureau of Labor Statistics, "Monthly Labor Review," August 1981.

ment committees on union-management relations are unclear, since existing committees differ in focus (e.g., training, quality control) and scope, and since the current increase in interest in committees seems linked at least in part to current economic conditions and import levels.

Second, new regulations and regulatory bodies began to influence labor-management relations in the areas of occupational safety and health protection and equal opportunity in hiring and promotion in the 1960's and 1970's, beginning with the 1969 Coal Mine Health and Safety Act and continuing with the 1970 Occupational Health and Safety Act and the 1972 Equal Employment Opportunity Act.[14] New regulations served to force changes in union practices, including contract modification. Some observers believe that government regulation of hiring, promotion, and occupational health and safety practices may have undermined the value of collective bargaining in those areas, by establishing new complaint mechanisms for workers outside the traditional industrial relations framework, and placing an emphasis on concerns of the individual worker rather than the bargaining unit.[15] Occupational health and safety regulations, in particular, may also affect unions by promoting technology change in general and automation in particular. And, as noted earlier, regulations motivated improvement in personnel management.

Programmable automation may present opportunities or liabilities for labor organizations. How labor organizations are affected by programmable automation depends on how the equipment and systems are developed and implemented, and on where they are used. To develop an understanding of how programmable automation may affect labor organizations, a variety of issues should be addressed, such as the aspects of programmable automation design and implementation that may be fundamental to union (and other labor) responses to programmable automation, the degree to which workers consider programmable automation design and implementation characteristics to be inevitable or negotiable, and, in particular, the impact of programmable automation on the organizing base for unions.

While unions are perceived as representing primarily production workers, the application of programmable automation to all aspects of the manufacturing process, including nonproduction activities such as drafting and inventory control, may broaden the base of workers interested in organizing. Already, scientific/engineering and clerical unions have been formed, serving constituencies which may be especially vulnerable to technological change in the future. Whether nonproduction workers do organize at higher rates, and if they do, whether they join unions dominated by production workers or separate labor organizations, may be important factors in determining how labor organizations influence the spread of programmable automation and moderate its impacts.

[14] Public Law 91-173, Public Law 91-596, and Public Law 92-261, respectively.

[15] Phyllis A. Wallis and James W. Driscoll, "Social Issues in Collective Bargaining," in *U.S. industrial Relations 1950-1980: A Critical Assessment*, Jack Steiber, et al. (eds.) (Madison, Wis.: Industrial Relations Research Association, 1981).