A STUDY COMPARING THE LEVELS OF PERFORMANCE OF EMPLOYEE INVOLVEMENT TEAMS TO THOSE OF TRADITIONALLY SUPERVISED EMPLOYEES DOING THE SAME WORK

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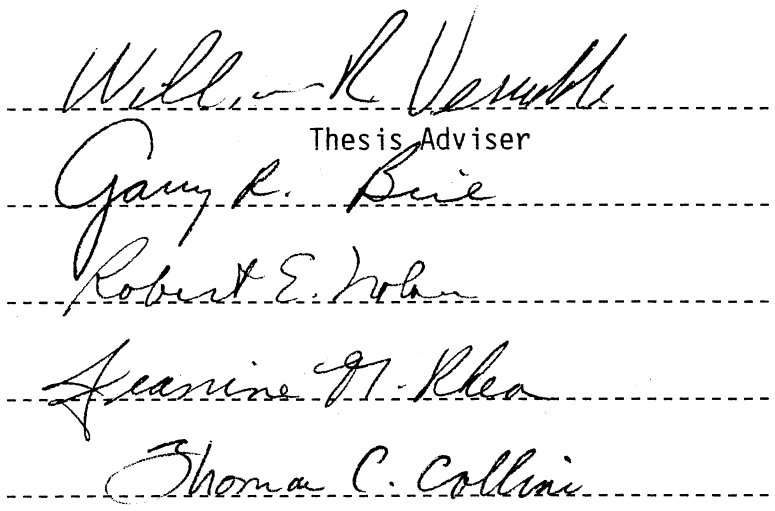

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TABLE OF CONTENTS

Chapter		Page
I.	INTRODUCTION.	1
	Statement of the Problem	1
	Purpose of the Research	2
	Hypothesis.	2
	Limitations	2
	Assumptions	3
	Definition of Terms.	3
	Organization of the Study.	5
II.	REVIEW OF LITERATURE	7
	Introduction	7
	Overall Environment.	8
	The Human Resource	9
	Management Restructure	13
	Unions	15
	Productivity	16
	Future Organizational Trends	17
	Japan Incorporated	17
	National Focus.	18
	Why Had Japan Kept Winning.	19
	The Human Resources Approach	21
	The Workplace.	22
	Characteristics of Participative Plants	24
	Unions	26
	The American Workforce.	27
	Workforce Quality and Technology Adeptness . . .	30
	Corporate Culture	32
	Types of Culture	35
	Culture and Change Efforts.	36
	Quality.	37
	Barriers to Quality	38
	Malcolm Baldrige National Quality Award Criteria	39
	Employee Involvement Definition.	39
	Setting the Stage for Employee Involvement	40
	Employee Involvement-Overall Environment.	41
	People-The Key to Performance.	42
	Employee Involvement Studies	43
	What's Required for Success in American Corporations.	45
	Successful American Organizations	47
	Types of Employee Involvement Groups	49

Chapter Page

The Team Approach 51
Teams as Building Blocks 52
Steps in Launching Employee Teams 53
Steps in Starting an Employee Involvement System . 54
Employee Involvement's Role in Enhancing Productivity . 55
Learning from Our Competitors. 56
Pay As a Motivator-A Myth Destroyed 57
Items to Consider for Improved Performance . . . 58
Summary. 59
Employee Involvement Results 61
Problems With the Employee Involvement Approach . . . 62
Problems as Viewed by the Individual 62
Lack of Implementation in Japanese Owned Plants. . 63
Productivity Study 63
Employee Involvement and American Industry . . . 64
Some Perceptions of Employee Involvement 65
Two Examples of Employee Involvement's Failure . . 66
Summary 68
Management Problems Associated With Employee Involvement 70
Current Managerial Practices 70
The New Wave of Management Thinking. 71
Resistance to Employee Involvement Systems . . . 72
Summary 73
Failures of Employee Involvement Endeavors 74
Summary. 76

III. METHODOLOGY 81

Introduction 81
Population 82
Selection of Study Groups 82
The Treatment 83
Team Dynamics 84
Research Hypothesis 86
Type of Research Conducted 86
Quasi-Experiment 86
Data Collection Procedures 87
Statistical Analysis 89

IV. PRESENTATION OF FINDINGS 91

Statistical Techniques Employed 91
Analysis and Results-Descriptive Data. 93
Study Group Subjects. 93
Study Group Treatment Variables 98

Chapter Page

Hypothesis Tests-Productivity. 103
Analysis- The t-test 103
Analysis- Chi-square 107
Hypothesis Tests- Results 109
Analysis- The t-test 109
Hypothesis Tests- Work Days Lost (Annualized) . 110
Analysis- The t-test 110
Analysis- Chi-square 111
Hypothesis Tests- Expense Supplies 112
Analysis- The t-test 112
Analysis- Chi-square 113
Hypothesis Tests- Total Expense 113
Analysis- The t-test 113
Analysis- Chi-square 114
Hypothesis Tests- Quality 115
Analysis- The t-test 115
Analysis- Chi-square 116
Productivity Projections 116
Summary 118

V. SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS. . 119

Summary. 119
Conclusions 122
Recommendations for Practice. 124
Recommendations for Further Research 124
Implications 125

REFERENCES 127

APPENDIXES 140

APPENDIX A - HISTORY OF THE MANUFACTURING PROCESS AND SYSTEM 141

APPENDIX B - CORPORATE EMPLOYEE INVOLVEMENT RESULTS. . . 144

APPENDIX C - STUDY POPULATION DESCRIPTION 151

APPENDIX D - STUDY DATA POINTS. 153

APPENDIX E - STATISTICAL TEST RESULTS 155

LIST OF TABLES

Table		Page
I.	Study Group Gender Analysis.	110
II.	Study Participant Age Matrix	111
III.	Study Group Analysis by Ethnic Background	112
IV.	Study Group Analysis by Gender/Ethnic Background (Male)	113
V.	Study Group Analysis by Gender/Ethnic Background (Female).	113
VI.	Study Group Analysis by Achieved Education.	114
VII.	Productivity Index Projections.	133

LIST OF FIGURES

Figure		Page
I.	Productivity.	115
II.	Productivity - Adjusted	116
III.	Results	117
IV.	Work Days Lost (Annualized).	118
V.	Expense Supplies	118
VI.	Total Expense Dollars.	119
VII.	Quality Index	120
VIII.	Productivity Projection	133

LIST OF EXHIBITS

Exhibits		Page
I.	T-Test Results - Productivity	121
II.	T-Test Results - Productivity Modified	121
III.	Productivity with Data Points Adjusted to 100.	122
IV.	Productivity by Period by Group	123
V.	Productivity Chi-square Analysis	124
VI.	Productivity (Base 100) Chi-square Analysis	125
VII.	T-Test Results - Profotability.	126
VIII.	T-Test Results - Work Days Lost	127
IX.	Work Days Lost Chi-square Analysis	128
X.	T-Test Results - Expense Supplies.	129
XI.	Expense Supplies Chi-square Analysis.	129
XII.	T-Test Results - Total Expense.	130
XIII.	Total Expense Chi-square Analysis.	130
XIV.	T-Test Results - Quality.	131
XV.	Quality Chi-square Analysis.	132
XVI.	Least Squares Trend Line.	134

CHAPTER I

INTRODUCTION

In the global economy, all competitors had capital, technology, and competence. The major variables that affected a company's competitive viability were governmental policy and people.

Participative management schemes that were being espoused by management and leadership gurus, such as Tom Peters and Peter Drucker were all based on the premise that people were the competitive advantage in today's marketplace. It was further stated by many employee involvement disciples that if management chose not to utilize this strength, American industry would not be the leader in the world economic community.

Most companies which were achieving acceptable results were not particularly interested in changing their ways. According to Ralph Barra, "we are great at maintenance management and happy with small improvements." Participative management is a method of obtaining larger improvements (Pennar, 1988, p. 101).

Statement of the Problem

Many successful large companies were not generally implementing participative management methods. The current management literature was

replete with unsubstantiated claims that participative management and employee involvement were the keys to increasing productivity.

The problem which gave rise to this study was the inadequacy of research which established that participative management and employee involvement systems contribute to increased productivity.

Purpose of the Research

The purpose of this study was to compare the levels of performance of employee involvement teams to those of traditionally supervised employees doing the same work.

Hypothesis

The null hypothesis was that there was no significant difference between the levels of performance of employee involvement teams and those of traditionally supervised employees performing electronic assembly operations at a major manufacturing facility.

Limitations

The study contained the following limitations.

1. The population used for this study was limited to occupational employees of a major electronics assembly plant located in Oklahoma.

2. Subjects for training were selected by management and the selection was based on total group populations, areas, and status against production schedules.

3. Actual participation by the subjects in team activity was voluntary.

4. Training of subjects was mandatory.

5. The downsizing of management was implemented during the study period.

6. Experts claimed that a five to ten year implementation period was required for employee participation to be fruitful (Dumaine, 1990).

7. Constraints were present in union contractual areas and in the personnel areas because the study was conducted in a union environment.

8. Management support, or non-support, was not evaluated during the study.

Assumptions

The subjects who volunteered to make up the employee involvement teams were interested in successfuly implementing this new workplace approach.

Definition of Terms

The following terms were used in this study:

Computer-integrated manufacturing (CIM) - Computer aided design (CAD) and computer aided manufacturing (CAM) linked in a system that manages data flow while directing the movement and processing of material. A manufacturing system that integrates the resources that are required for value added manufacturing, ie., people, material, capital

and information into a production process that operates in a real-time environment.

Continuous in-line manufacturing (CIM) - A production process that utilizes the principles of computer-integrated manufacturing. A continuous in-line process begins a task at the input station and a finished product comes out of the process at the "end of the line" without any manual material handling intervention by factors outside of the planned process.

Employee involvement (EI) - A system of managing people, structures and systems that allow for a level of participation, as viewed from an employee perspective. (Participative management is the same thing but viewed from a management perspective.)

Just-in-time production (JIT) - A philosophy that focuses attention on the elimination of waste. In a broad sense it is the elimination of waste by purchasing or manufacturing just enough of the right items just in time, since material is the major cost associated with high technology goods.

Kaizen (A Japanese word.) - The cornerstone of the Japanese production process which is based on continuous improvement and involving everyone in the process.

Kanban (A Japanese word.) - A manual inventory control procedure developed by Toyota that uses cards to keep inventory status highly visible and that manages production so that necessary units are made in the necessary quantities at the necessary time.

Keiretsu (A Japanese word.) - Japanese business alliances between companies in the same field and across all economic sectors of their economy.

Total quality control (TQC) - A strongly held belief that errors, if any, should be caught and corrected at the source, not at the end of the process.

Organization of the Study

There was a need for more empirical evidence about the effects of employee involvement systems upon the financial and every-day results of business enterprises. Chapter I was the introductory chapter and contained sections which related to the reasons that empirical evidence was required. Chapter I also included the statement of the problem, the purpose of the study, the hypothesis, the limitations of the study, the assumptions of the study and definitions of specific terms used in the study.

Chapter II presented literature about employee involvement systems, both positive and negative. This chapter also evaluated various approaches and environments that were required to inaugurate employee involvement systems.

Chapter III included the procedures that were used in the study, the population, the instrumentation, and an explanation of how the data were analyzed.

The findings were presented in Chapter IV.

Chapter V consisted of the summary of the study, conclusions based upon the study results, recommendations for practice, recommendations for further research, and implications of the study.

CHAPTER II

REVIEW OF LITERATURE

Introduction

No discussion of productivity or employee involvement systems can take place without a comprehensive look at the factors that influence the way business operates in the global economy and in the United States. This chapter evaluated the different environmental factors that affect our country's capability to compete and established and discussed the methodology and approaches that were required to initiate employee involvement systems in workplaces, assuming that these employee involvement approaches had merit.

Since the dawn of creation, the human race had survived as a species and prospered because it could adapt to change. Wantuck (1989) believed that this same adaptability would be required if the United States was to succeed in the global market. Americans no longer enjoy the world's highest standard of living and have ranked last among the industrialized nations in the rate of productivity growth (Grazier, 1989).

Grazier (1989) claimed that most businesses were profitable and successful and believed that most Americans had enjoyed a reasonably comfortable standard of living. Because of that, he believed that there

was no motivation to change the way people worked and behaved in our society.

Hoerr (1989) stated that if the United States was to become a world-class manufacturing nation, companies must produce in small lots and must customize products to increasingly unique demands. This approach called for flexible work practices and workers who were willing to shift from job to job.

The study evaluated the different interdependent variables associated with employee involvement and participation programs and presented different approaches that were utilized in implementation. The work concentrated on the manufacturing sector, but the lessons learned could be applied to other sectors of the economy as well.

Overall Environment

According to Peters (1990), 46% of the Fortune 500 companies dropped out of this elite group during the last decade, and the same could be expected for the 1990's. Peters wrote that speed and time management were required in order to compete. Slow responses in today's economic climate resulted in loss of market share and quality was no longer a strategic advantage or selling point.

Peters believed that leadership was about emotion, not administration. Taylor's theories and stop-watches were out. The workplace must become a university in order for business to survive, and business will win based upon employee brains, not muscle, because machines would do 90% of the work (Peters, 1990).

Naisbitt (1990) forecasted a resurgence of art, literature, humanities and a spiritual new Renaissance. He believed that our human resources could be the competitive edge for the United States.

"The most successful corporations of the 1990's might be something called 'learning organizations,' a consummately adaptive enterprise in which free workers, freed to think for themselves, can identify opportunities and problems which they are free to solve themselves. The manager of tomorrow must be able to get people to commit themselves to the business" (Dumaine, 1989, p. 49).

Dumaine (1989) stated that the key issue would be empowerment, a term whose strength suggested the need to get beyond merely sharing a little information and a bit of decision-making authority.

The Human Resource

Nussbaum (1988) stated that the nation's ability to compete was threatened by inadequate investment in our most important resource: people. Ehrlich and Garland (1988) believed that too many workers lacked skills to perform more demanding jobs, and as the economy came to depend more and more on minorities, the United States faced a massive job of education and training, starting with kindergarten.

Tomorrow's pool of available workers will be smaller and underprepared in basic workplace skills. The labor demographics will be characterized by more women, older persons, more disadvantaged, and more minority workers. The Educational Testing Service reported that "the nation's youth have reached a minimum standard of literacy but few can

use this knowledge and skill for thoughtful or problem solving purposes" (Baker, 1989, p. 17).

Nussbaum (1988) best summarized the situation facing the American economy in the coming years:

> Take a trip back to what may be our future. It is the 1851 Industrial Exibition at the Crystal Palace in London. Britain is the dominant world power. The U.S. is No.2 in industry and catching up fast. Made in America reapers, muskets, and tools are the marvels of the show. British businessmen are amazed at what they see. Products are assembled from completely interchangeable parts. Here is true mass production for the first time. So impressed are they that they name it 'the American system of manufacture.' Worried delegations of British industrialists set sail to investigate. Their findings? American manufacturing prowess is in large part due to a highly educated workforce. The Yankees have an astonishing high literacy rate of 90% among the free population. In the industrial heartland of New England, 95% of the adults read and write. In contrast, just two-thirds of the people in Britain are literate.
>
> Now zip ahead a century or so to the 1980's. The U.S. is the dominant world power, and it is Japan that is No.2 and closing fast. America's CEO's marvel at the quality of Japanese products flooding their markets. They make pilgrimages to Tokyo. Their findings? Manufacturing superiority is being forfeited to the Japanese. And yes, once again, behind the success lies a better

educated workforce. In 1988, Japan's functional literacy rate is better than 95%. In America it's down to about 80% (Nussbaum, 1988, p. 101).

Enhancing human capital needed to be a national priority. According to Nussbaum (1988), the evidence was overwhelming that people, not machines were the driving force behind economic growth. In the period from 1948 to 1982, the nation's GNP increased at an annual rate of 3.2%. Edward Dennison, an expert in growth economies, found that one-third of that gain was caused by the increase in the educational level of the United States workforce and about half the growth was the result of technological innovation and increased know-how, which also depend on education. But just 15% of the total increase was the result of more capital equipment (Nussbaum, 1988).

"For the past several decades, we have scurried to find jobs for people," said John Sloan Jr., president of the National Federation of Independent Business. "In the future, we will scurry to find people for the jobs" (Kelley, 1989, p. 1). This shortfall was not due to the decrease in population and participation rates, but to the deficiency in skills available to fill the more technologically advanced new jobs that are being created (Kelley, 1989).

"Another 20 million jobs, or so, will be created in the next decade, but the service industry will swallow nearly all of them, said William B. Johnson, a vice president of the Hudson Institute and director of a study on the issue entitled, 'Workforce 2000.' The nation

is facing a monumental mismatch between jobs and the ability of Americans to do them" (Bernstein, 1988, p. 104).

Bernstein (1988) claimed that three forces were combining to produce the leap in the skills that the economy required. First, technology upgraded the work required in most jobs. Second, job formation was fast; mainly, in high skill occupations with most in the service sector. Finally, the way work was being organized required a complete new set of skills. As companies shifted to work teams and participative management schemes, employees needed to sharpen their abilities to communicate.

Zemke (1989) wrote that technology was a major force that was driving change and that will contribute to the need for increased literacy levels since the latest production technologies were too sophisticated for many of the people entering today's workforce. Technology would force business to retrain 75% of their current workforce by the year 2000 (Dentzler, 1989). In addition, 90% of all jobs would be candidates for augmentation, replacement, or displacement by expert systems or other forms of artificial intelligence between 2000 and 2005 (Ehrlich & Garland, 1988).

Cooperman (1988) wrote that the United States economic model was clearly the most desirable, as evidenced by its application in the Pacific rim and in the emerging economies of the Eastern bloc. The emerging economies were working on three variables to implement the above model: the first was to improve literacy, the second was a

commitment to technological leadership, and last, to reinforce the work ethic.

Bennett (1990) claimed that some productivity experts felt that if business was working on improving labor productivity, they were wasting time. Very few companies had more than 10% labor costs, and cash flow was more important than earnings per share. Yet, employee involvement was a way of not only improving attitude but also of making an improvement in costs, an incremental journey in becoming more competitive.

Management Restructure

Labich (1990) wrote that after a decade of mergers and buyouts, of downsizing and upheaval, he believed that corporate America was suffering an executive brain drain. The radical restructuring of the 1980's had given today's managers a jaundiced view of the corporation for which they work. The implied contract between employee and employer had been altered and there was a low level of trust at some companies. United States corporations may be at a disadvantage battling Asian or European competitors that still enjoy fiercely loyal work forces.

Pascarella and Peters (1984) found that managers liked to think of themselves as agents of change--as people who manage change. But they claimed that managers had fooled themselves by thinking their systems and controls had brought positive change. Leaders empowered people, giving them the resources and environment in which they could find the route to change.

Hillkirk (1990) wrote that Deming believed that the United States economy was rapidly deteriorating and that only United States managers had the power to do anything about it. The solution was to change society. "Teach kids cooperation, not competition. Eliminate grades in school and merit pay at work. Give workers the power to do their jobs correctly, and systems and tools that let them enjoy their work" (Hillkirk, 1990, p. 4B).

Middle managers had been caught in massive workplace changes which had been the result of global competition, advancing technologies, and new managerial philosophies. Traditional roles as protector of management perogatives had given way to a new function "as the liaison between management and labor" (U.S. Government, 1990, p. 31).

Scores of large organizations had sharply cut staffs over the last few years, but few had realized the expected cost savings. Cutting staffs to cut costs was putting the cart before the horse. Drucker (1991) stated that the only way to reduce costs was to restructure the work which would result in the reduction of people required to do the job.

Zemke (1990) stated that the bodycount was mounting. DOWNSIZING: RESHAPING THE CORPORATION FOR THE FUTURE, estimated the toll at 1.5 million managers and climbing. Amands Bennett, a staff reporter for the Wall Street Journal, doubled that figure to three million. Managers made up 10% of the United States labor force in 1980, while they accounted for only 4.4% of the jobs in Japan, 3% in Germany, and 2.4% in Sweden. Every gain in blue collar and factory productivity registered

over the last 10 years had been offset by decreases in white-collar efficiency.

Drucker (1988a) believed that the typical large business, 20 years hence, would have fewer than half the levels of management of its counterparts today and no more than a third of its managers.

Unions

"The role of unions is also declining. The shifts within American industry from traditional manufacturing to high technology have preempted unionization. Union membership continues to decline: from 27.3% of the labor force in 1970 to 18.6% in 1985, with a projected 15% expected in 1995" (Cooperman, 1988, p. 21).

The government had taken over the role of the unions by dealing with pensions, insurance, worker's compensation and senority protection. "Unions are an expensive insurance that people no longer need" (Robertson, 1987, p. 1).

According to Cohen (1990b), competition had revolutionized relations between management and labor who had found that both must become partners to survive. Though there had been a growing alliance, conflict remained. He stated that cooperation was really co-opting. For partnerships to make their businesses more competitive, both sides--management and unions--must adapt. Managers must relinquish some authority and give workers more responsibility, while unions must become more flexible to increase competitiveness.

Productivity

The productivity of America's non-farm workers fell 0.8 percent in 1990, the worst decline since 1982, and the first back-to-back reversal, coupled with the 1989 drop of 0.7 percent, in a decade (Associated Press [AP], 1991).

Increasing productivity, or getting more worker output per hour on the job, was considered vital to increasing the nation's standard of living without inflation. According to the AP (1991), the United States continued to lose its competitive edge in international markets which threatens a long-term reduction in living standards "unless one of two things happen--either the quality of our labor force is improved through education, or we sharply improve savings and investment in new plants and equipment" (AP, 1991, p. 13).

Toffler (1990) believed that all of the old economic theories, models, and measurement methods, designed for the smokestack era, were becoming increasingly obsolete, including management's notions of efficiency and productivity. The mass production of millions of identical products was viewed as "modern times" but today, computer-driven technologies make it possible to turn out small runs of increasingly customized goods and services aimed at niche markets.

In the 1920's, one out of every three Americans in the labor force was a blue-collar worker in manufacturing. In the 1950's the figure was one in four. The figure was one in six in the 1980's and dropping, and even with this, manufacturing remained steady at 23% to 24% of Gross

National Product (GNP) over the last 30 years, and had grown in absolute terms (Drucker, 1988b).

Future Organizational Trends

In summary, Allen (1990) forecasted that the organization of the future would be flexible and strong and that it would be in a constant state of change. Wasteful, inefficient, and rigid organizations would cease to exist, and more productive and innovative organizations would take their place. Future trends in work may include: organizational power pushed to lower levels, decentralized organizational structure and decision making, increased emphasis on service industries, line supervisors who take more responsibility as a teacher and resource for their employees, increased power to consumers and constituents, autonomous work teams and entrepreneurial groups, more fluid organizational structures, informal approaches to work, a wider degree of diversity among employees, recognition of individual need for self-fulfillment and growth, and greater rewards for innovation and creativity within the organization--in otherwords, a participative approach to operating the business.

Japan Incorporated

No discussion of economic well being, productivity, or work groups could be complete without a brief look at the economic marvel known as Japan Incorporated.

Japan's accomplishments and processes were important because they were our main competition and were the ones that inaugurated the use of work groups into the manufacturing process. We, in the United States, needed to understand their system because we were trying to emulate their success.

National Focus

Japan had demonstrated clearly the positive effects of creating a national focus on serious issues. Studies had looked at our toughest competitor; Japan:

* Had the lowest crime rate in the world.
* Had the lowest unemployment rate in the world.
* Had the highest average life expectancy.
* Had the best transportation and commuter systems.
* Led the world in patents.
* Had the toughest pollution control standards.
* Ranked first in scores on international achievement tests in science and math taken by school children.
* Had the highest percentage of students completing high school.
* Had the highest literacy rate (Grazier, 1989).

"What works for the Japanese is a system, an idea, a covenant, a culture of adversity. There is a covenant on the part of the average person to be a part, to accept authority; a covenant on the part of the person at the top of the matrix to be respectful of those below him. They had a capitalism different from one being utilized by the United

States, a state-guided, communal capitalism. The people at the top do not earn that much, and the people at the bottom do not earn too little" (Bodek, 1989, p. 9). To the Japanese there were a number of component parts that were important: 1.) Japan had the best blue-collar workers in the world, not just in attitude but in preparation, 2.) had a high number of practical engineers flooding the factory floor making tiny little improvements and designing for quality, 3.) had a close incestuous relationship between banks and companies, which allowed for a long term approach to business, and 4.) leadership of the high bureaucracy, MITI (Ministry of Finance and the Ministry of Trade and Industry), guided Japan's limited resources into areas where the resources could do the most good (Bodek, 1989).

Why Had Japan Kept Winning

Forget Just In Time (JIT). The answer was bigger: it practiced a different brand of capitalism, dominated by industry alliances. Mention shareholder rights to a Japanese executive, and one heard about employee rights. In the United States, shareholders, managers, and employees aimed at one thing--money, money, money. KEIRETSU. In America, it would be called collusion. In Japan, it was called a business alliance (Rapoport, 1991).

In an attempt to identify the key ingredients that made the Japanese such a powerful force in global business, it boiled down to the fact that the Japanese had higher expectations than most Americans and Europeans (Kearns, 1989).

KAIZEN strategy was the single most important concept in Japanese management--the key to Japanese competitive success. KAIZEN meant ongoing improvement involving everyone--top management, managers, and workers. The most important difference between management concepts was the Japanese, process-oriented way of thinking versus the West's, innovation-and-results oriented thinking (Imai, 1986).

Imai (1986) continued by stating that the results-oriented criteria for evaluating people's performance was probably a legacy of the "mass-production society," and the process-oriented criteria was gaining momentum in the post industrial, high tech, high touch society. KAIZEN was a humanistic approach, because it expected all employees to participate and was based on the belief that all could contribute to improving the workplace where workers spend one-third of their lives.

One of the distinctive features of Japanese work organizations was the cohesiveness of work groups and the strong social bonds that developed between superiors and subordinates. The survey underscored the pattern that Japanese reported two close friends at work while the Americans' averaged fewer than one (Peters, 1990).

Peters (1990) continued by pointing out that the average Japanese employee had thirty suggestions per year, while the average American employee had .14. The Japanese implemented 75% of the suggestions, the United States, a miniscule number.

Lincoln (1989) reported that Japanese supervisors functioned as counselor and confidante to their work groups, building communication

and cohesion with a minimum of direct, authoritarian control, as opposed to the American worker who wanted an arms length approach.

Lincoln (1989) found that organizations which, in Japanese fashion, coupled formal centralization with de facto participation had more committed and satisfied employees.

"The way to make great leaps is to take many small steps, consistently, every day" (Rehfeld, 1990, p. 169).

The Human Resources Approach

American companies had now discovered what the Japanese learned long ago: people--not technology alone or marketing ploys--were the keys to success in global competition. American workers could be just as productive as Japanese workers. The keys to Japanese competitive superiority were their management and production systems, not some unique feature in Japan's group-oriented culture (Hoerr, 1989).

"The emergence of training and management, rather than cultural uniqueness, as the true secret of competitiveness, and of automation as the new manufacturing organization, must be recognized as it has been by Japan" (Drucker, 1987, p. 925).

According to Racicot (1990), Japan relied on discipline and responsibility to get ahead, the United States hid behind past accomplishments.

A top Japanese politician, Yoshio Sakurauchi, was quoted as describing the American worker as "being lazy, that thirty percent of the workers could not read, and that American workers want to get high

salaries without working" (Healey, 1992, p. 1). In 1984, a Japanese professor proclaimed the following law, known as "The Law of Technological Civilization":

> The forces changing the world today are basically technological, not military or political. Military rivalries are essentially obsolete. The tumultuous military confrontations between the U.S. and the U.S.S.R. have no essential meaning as far as the logic of history is concerned. Military and political forces can be reduced fundamentally to economic forces, and economics are based on technology. The world moves in whatever direction is dictated by technology, and the power of technology to change the world will become increasingly strong in the future. The world's geopolitical axes will converge more and more at the location where the new technology reigns. That center of convergence is, of course, Japan. S. Umano, 1984

The Workplace

Sheridan (1990) believed that the key ingredients that were essential for a world class manufacturer were: total quality management, Just In Time, and a work team approach in which workers assumed responsibility for a particular operation and were given the training to handle the added responsibility. Becoming world class was continually and rapidly improving in the eyes of the customer. Manufacturers needed to speak in terms of becoming, rather than being

there, because the world's standards of performance always increased. Thus, being "world class" could never be achieved.

In a growing number of companies, work teams were seen as an excellent means of fostering employee involvement. World Class Manufacturing lessons/action agendas included getting to know the customer, cutting WIP, reducing flow/manufacturing cycle times, cutting set-up and change over times, cutting flow distance and space, increasing make/deliver frequency, reducing the number of suppliers, cutting the number of part numbers, making it easier to manufacture without errors, arranging the workplace to eliminate search time, cross training, assuring that line people got first crack at problem solving before staff organizations, seeking to have plural, instead of singular workstations, and automate incrementally when process variability cannot otherwise be reduced (Schonberger, 1982).

Executives need to re-think how corporations hired and managed the work force. The keys to success were training and motivating workers to fully exploit today's sophisticated machinery (Nasar, 1989).

Grooms (1990) believed that in order to achieve success, all employees needed to be treated as equal partners in the day-to-day activities of the company. This approach proved to be easier in a start-up operation because there were no existing cultural hang-ups to confront.

Grooms (1990) pointed out that management needed to acknowledge that the future belonged to only those organizations that could coordinate the total efforts of all its employees to meet the goals of

the organization. According to Dr. Deming, management represented 88% of the problem and management's task should have been to create an environment that established an atmosphere of open communication, mutual respect, trust, and empowerment.

Improving one's business processes was the key to increased profits and market share according to Harrington (1988). The only way improvement gains could be effectively and permanently embedded in the fiber of the company was through changing the systems that controlled the company's operations. It was not employees or managers that caused the bulk of the errors, rather the operating systems that governed and controlled the company's performance (Harrington, 1990).

To get economies of scale, companies had organized in vertical functioning groups. Most work activities flowed vertically not horizontally. The horizontal workflow and vertical organization resulted in many voids and overlaps, and encouraged sub-optimization, causing a negative impact on the efficiency and quality of the operation. Employees must work WITHIN the process, and management must work ON the process (Harrington, 1990).

Characteristics of Participative Plants

Lawler (1990) believed that characteristics of new participative plants were:

SELECTION- the selection process in the new participative plants placed a great deal of emphasis on acquainting applicants with the

nature of the jobs and with the nature of the management style utilized, some utilized a selective process by the workers themselves.

PLANT PHYSICAL LAYOUT- notible for the degree to which the workplace was egalitarian.

JOB DESIGN- employees determined who and how the task was to be carried out. Employees set production targets, quality metrics, and controlled employee behavior.

Although self-managed work teams had become more popular, most studies suggested that a relatively small percentage of the work force (less than 10%) operated with this structure. What had become extremely popular was the use of quality circles, or problem solving teams. Some studies suggested that more than half of all large corporations used them (Lawler, 1990).

PAY SYSTEM- instead of using a job evaluation approach, new plants evaluated skills of individuals and paid according to the number and kind of skills one possessed. Studies showed that less than 20% of the work force had "skill-based pay" (Lawler, 1990).

ORGANIZATIONAL STRUCTURE- characterized by very flat structures and extremely wide spans of control. Most of the plants featured only two levels of management, though there may be three in larger ones. Many of the reductions had been carried out simply to cut costs (Lawler, 1990).

TRAINING- the new participative plants heavily emphasized training, career planning, and personal growth.

MANAGEMENT STYLE- pushed decision making responsibility down to the lowest possible level.

These new plants were generally acknowledged to be effective and were likely to continue to proliferate. Conversion of the old plants to the participative model was likely to grow simply because there were so many that needed improvement (Lawler, 1990).

Unions

Ephlin (1989) believed that the dawn of the flexible work force had divided organized labor down the middle. Many workers feared that cross training devalued their job skills making them more vulnerable to layoffs. Older workers, on the other hand, felt that the sharing of skills deprived them of their traditional right to an easier job as they approached retirement. Much of the opposition came from deep-rooted worker suspicion of management.

"The union getting in bed with management? Why not? They own half the bed (Wilgus, 1990, p. 631)." The practical keys for creating a responsible employee atmosphere in a union, or a non-union environment, were work design, the reward or discipline system, utilization of employee ideas, and whether management acted as "cop or coach" (Wilgus, 1990, p. 632).

Much of the resistance to the employee involvement thrust among union leadership was rooted in the traditional labor-management relationship, based as it was on detailed contracts, the uniform administration of provisions, narrow job designs, and an emphasis on stability. The union power base was being challenged by the movement toward collaboration, flexibility, and change. Power, wherever it lies,

cannot, in the long run, be disassociated from responsibility (Thompson, 1987).

Huber (1986) believed that in order to be successful there needed to be a relationship based on trust, one where the leaders of both union and management start the process.

The American Workforce

Ira Magaziner, chairman of Commission on Skills of the American Workforce, worried that the United States was becoming distinctly less civilized. "He pointed out that some 2,000 years ago, Aristotle described the difference between a civilized culture and a barbaric one. In a civilization, Aristotle said, society advances because every generation of parents tries to do more for its children. Barbarians live only for the day and accumulate in order to consume, then accumulate again. Since this republic was founded, we have had ten generations that have left more to their children than they have inherited, our generation is in danger of doing the opposite. We are selling off our assets and leaving our children with a huge national and international debt" (Perry, 1990, p. 146).

An anonymous copywriter came up with a slogan that fast became the phrase of the land: "People are our most important asset." Companies loved it. Soon, the line appeared in annual reports everywhere. The only problem was companies did not really value their employees very much. "One day, foreigners invaded the kingdom. These international companies were flexible, quick, and responsive to customers. Searching

for ways to compete with the invaders, a few American companies discovered that, given a little freedom and proper training, workers could do things that machines could not. People could grow, invent, and solve problems. Perhaps people truly were an enterprises most important asset" (Perry, 1991, p. 68).

Remember the joke about cars that were built on Friday? The joke reinforced something consumers all felt: workers were responsible for poor product quality. In statistical analysis of quality problems, Deming found that the overwhelming majority of quality problems were caused by circumstances over which the worker had no control. In fact, worker caused quality problems amounted for less than 10% of the overall number. If the workers had not caused the problems, management must have. The experts adroitly shifted from worker bashing to management bashing. The American style of management was seemingly responsible for everything from quality problems to the common cold. Yet, the American managers were doing exactly what their Japanese counterparts were doing--managing according to a specific set of rules. The problems were rooted in the way American managers had chosen to run the business. Bad processes were the culprit, not bad people (Garwood, 1990).

Garwood (1990) stated that the American management style was vitally concerned with worker efficiency and driving down labor costs. Time and motion studies were commissioned so that management would know, within a millionth of a second, how long a task took and could do a standard, versus actual cost comparison, for every operation. Of

course, the shop supervisor had no time to supervise because all of their time was spent explaining variances.

When things went wrong in manufacturing, it was easy to blame the production workers. Traditionally, they had been considered the weakest, most vulnerable link in the chain of command. After all, as the theory goes, replacing a production worker was easier than replacing a manager or a machine (Fisher & Israeli, 1989). Companies still viewed the worker as a cost that should be minimized, not as a resource to be developed (Garwood, 1990).

Nearly three-quarters of the engineers polled agreed with the statement that a poorly educated and trained work force hindered United States productivity. In concert with that opinion, 63% said that employees did not work as hard as they did in 1980. Eighty percent said the lack of a strong work ethic contributed to low productivity. In addition, large majorities stated that employees were not motivated at work, that they took less pride in their work, that they were less loyal, that they did not enjoy coming to work, that they were not enthusiastic about their jobs, and that they resisted change (Filipczak, Gerber, Gordon, & Thompson, 1990).

Business people complained that many of today's young, entry level workers were not prepared for the workplace. Many such workers had high absentee rates, failed to perform high quality work, and lacked a cooperative work attitude. Three-fourths of the new work force entrants would be qualified for only 40% of the new jobs created between 1985 and 2000 (Szabo, 1991).

Workforce Quality and Technology Adeptness

American organizations had been short-changing their investment in human capital. After unsuccessfuly trying to solve productivity problems in the 80's by pouring billions into capital equipment, business leaders recognized that the only way to reverse this decline was to invest in people (Noack, 1991). Adam Smith wrote, over 200 years ago, in THE WEALTH OF NATIONS: "A man educated at the expense of much labor and time to any of those employments which require extraordinary dexterity and skill may be compared to one of those expensive machines" (Noack, 1991, p. 80).

According to Noack's (1991) research, American corporations were spending $45 billion in formal training, and an estimated $200 billion on informal training, salaries, facilities, etc. This was almost equal to expenditures made on formal public education.

To have world-class quality and costs, and the ability to assimilate new technology, the United States must have the world's best ability to develop human capabilities (Smith, 1987).

Nationally, a University of Texas study revealed that 27 million adults in the United States were functionally illiterate. As companies moved in the direction of decentralizing management, with authority and responsibility moving down the organization, it became imperative to invest time and money to help employees expand their capabilities (May, 1990).

Of all the paradigms discussed, the idea of "checking ones brain at the door when one picks up ones time card" was probably the most pervasive in American industry. For employee involvement to work, there had to be a baseline change in attitudes. A shift in the paradigm, "I think, you work," just would not work (Garwood, 1990).

The urgency of retraining employees was hardly news. Every government commission, think tank, and business roundtable had grown hoarse with the same refrain: The days of plentiful labor were gone, and a shortage of adequately skilled manpower was here; "corporations can no longer afford to cast aside existing workers like spent machine parts but must retrofit them with the techniques and knowledge necessary to adapt to vast organizational, technological, and economic changes" (Houston, 1990, p. 35).

Seventy five percent of the Human Resource executives surveyed stated that education had not kept up with the nation's technological growth. The United States was on a collision course with the reality that this nation was developing a second class work force. Money was being diverted to remedial education and to basic training from more productive uses, such as research and development (National Alliance of Business [NAB], 1990).

The thinning of middle management to make companies more productive and competitive required profound changes in the way management looked at human resources. (Gaines, 1991).

Although companies had embraced downsizing as a tool to lower costs as they struggled to remain competitive, their senior managers realized

that "they can only cut so much fat before hitting bone, muscle, nerves and vital organs. When the fat is gone, the remaining workforce will probably be of uneven quality" (Penzer, 1991, p. 97). The majority of employees to which management pays little attention, non-management, were the ones that represented the highest potential for the organization (Penzer, 1991).

Penzer (1991) continued by stating that empowerment meant giving workers, at all levels, the knowledge, confidence and authority to use their judgement to make important decisions. The result could be a work force that was charged, dynamic, motivated and happy.

"Right now, at most American companies, employees feel impotent. Bureaucracy is high, hierarchies are complex, workers are told what to do, and then hammered to improve" (Penzer, 1991, p. 98). The key to success was empowerment, and the key to empowerment was training (Penzer, 1991).

Corporate Culture

Corporate culture was a variable that needed to be evaluated because in order to implement change, the existing culture required modification, and took time (Dumaine, 1990a).

"You've automated the factory, decimated the inventory, eliminated the unnecessary from the organization charts, and the company still isn't hitting on all cylinders--and you've got an awful feeling you know why. It's the culture" (Dumaine, 1990a, p. 127).

Culture, as defined by a social scientist, consisted of the "man-made aspects of an environment" (Jennings, 1988, p. 3). For a company, that meant, among other things, an internal consistency that shaped behavior, values and patterns of how people thought, acted and spoke. More casually, culture was often defined as "the way we do things around here" (Jennings, 1988, p. 5). In otherwords, "culture" was what the company defined as "normal" (Jennings, 1988).

"Culture is inertial; it resists change" (Fombrun, 1988, p. 81). It implied that anyone who wanted to alter a culture should first understand the ways in which that culture protected itself from change (Fombrun, 1988).

To a certain extent, corporate culture was similar to national culture. It, too, had its roots in history, legends, heroes, villains, achievements, disasters, recoveries and hardships. The most powerful manifestations of corporate culture revolved around the organization's heritage: legends about particularly colorful or powerful early managers or founders and their values and ideas including myths about ancient glories and legendary accomplishments (Manzini, 1986).

Dumaine (1990a) stated that no culture change happened easily or quickly. Figure five-to-ten years for a significant improvement--but since the alternative may be extinction, it was worth a try. As always, actions spoke louder than words. Bosses transmitted values through rewards and punishments; ie., the compensation system revealed a great deal about what was actually rewarded and valued (Sirota, 1986).

Greiner (1967) stated that a few years ago the target of organization change was limited to a small work group or single department, especially at lower levels. The focus had now converged on the organization as a whole, reaching out to include many divisions and levels at once, and even the top managers themselves.

The corporations that might succeed and flourish in the times ahead would be those that had mastered the art of change, those which created a climate that encouraged introduction of new procedures and possibilities. Those which encouraged anticipation of, and response to, external pressures and those that listened to new ideas from inside the organization (Kanter, 1984).

Manzini (1986) believed that a corporation's culture could be a great asset, but could also be the greatest obstacle that may prevent management from looking at useful options.

Kilmann (1985) stated that culture provided meaning, direction and mobilization, a social energy that moved the corporation into either productive action or destruction. A large culture gap in industry may have related to the productivity problem in the United States.

The single most important determinant of corporate culture was the behavior of the CEO. "Shared vision" was the significant element in the system. Bennis (1986) defined leaders as people who did the right thing, and managers as people who did things right. Management dealt with efficiency and with making things run properly. Leadership, in contrast, was concerned with identity--why the organization was here;

what our organization's business was; what our organization's destination, goals, mission and values were.

In order to get others to change, managers must change first. Management by influence, rather than management by authority, was the style for action. There must be a climate of equality, fear must be driven out, and management must learn to take orders from the situation, not from each other (Hannah, 1990).

Dillingham (1991) believed that employees and companies must not fool themselves into treating change as a temporary state, as evidenced by a Coors Brewing Company survey taken in 1990. People wanted to be part of the solution.

Types of Culture

According to Deal and Kennedy (1982), there were four major types of cultures:

THE TOUGH-GUY/MACHO CULTURE- regularly took high risks and received quick feedback, attracted individuals that want to be "stars."

THE WORK HARD/PLAY HARD CULTURE- generally found in sales organizations where fast feed-back but low risk was the rule.

THE BET-YOUR-COMPANY CULTURE- Invested millions in the future, and the heroes and survivors had the character and confidence to wait--progress was the most important product.

THE PROCESS CULTURE- the low-risk/slow feedback process culture typically found in banks, government bureaucracies and utilities

striving for technical perfection, and the system's integrity was placed above all else (Deal & Kennedy, 1982).

Culture and Change Efforts

Successful change efforts focused on the work itself, not on abstractions like "participation" or "culture" (Beer, Eisenstat, & Spector, 1990).

People were writing about a "covenant" and not a contract between the employee and the company as a basis for superior management. The trend away from standardized mass production to specialized, high value added work, made command and control management less feasible. Coach and cajole leadership could not succeed unless employees' creativity was unleashed (Stewart, 1991).

Analysis revealed four types of tactics utilized in trying to accomplish change. The study found a 100% success rate when key executives used an intervention tactic, but observed this tactic in less than 20% of the cases. Both the persuasion and participation tactics had 75% success rates; persuasion had the highest frequency of use, 42%, and participation the lowest, 17%. Both made high demands on resources. Implementation by edicts had a 43% success rate and a 23% frequency of use (Nutt, 1986).

Quality

Industry had renewed its commitment to quality because quality was at the very crux of global competitiveness and the human side of quality was corporate America's greatest asset (Bemowski, 1990).

"Employee dedication mirrors the extent to which an organization demonstrates its commitment to its people. When people know what is expected of them, understand that outstanding performance is rewarded, and believe that they can make a difference and will be listened to, they make a difference," stated Frederick Smith, CEO of Federal Express (Bemowski, 1990, p. 18).

The quest for zero defects, as quality expert W. Edwards Deming advised in a recent paper delivered in Osaka, was not enough. That may be why six sigma was only the most prominent of five initiatives issued by Motorola to achieve an even more elusive goal at the company: total customer satisfaction. The other programs included participative management groups, profit improvements, product and manufacturing leadership, and cycle time development. Motorola's aim was to achieve plus or minus six sigma--equivalent to 3.4 defects per million parts. Put another way, the company wanted to be perfect in everything 99.9999998% of the time (Gill, 1990).

There were several steps a company could take to start on the road to quality. But only when top management insisted on quality, the company began the journey toward zero defects (Augenblick, 1990).

There were significant advantages to implementing total quality in a factory because people grasped the concept of quality easily. Furthermore, employees in a factory utilized measures, such as efficiency standards or production quotas, on a daily basis (Collitti, 1986).

Barriers to Quality

Roger Milliken, chairman and CEO of Milliken & Co., said that businesses had learned that there were only three barriers to executing a successful quality improvement process. "The first is top management, the second is middle management, and the third is first-line management" (Bemowski, 1990, p. 18).

According to Collitti (1986), the factory also had barriers to the total quality effort. For one thing, among the many people to be educated, some were illiterate and others had graduate degrees. Second, total quality was a difficult concept and it took time to understand. Third, total quality entailed a participative management style, and some people had trouble with that idea. Fourth, union management relations could have led to problems. Without good rapport, union officials may have viewed total quality as a threat to their existence. The keys to implementation were education and management commitment, in addition to complete participation. An individual who knew the machine best was the person who operated it, and that person needed to understand that it did not threaten his life or his job to participate in improving the

operation. Finally, it was recognized that any change process takes time. Total quality should be looked at as a six-year process.

The Malcolm Baldrige National Quality Award Criteria

In the Human Resource Utilization category, the award examined a company's efforts to develop and involve the entire work force in total quality. In addition, the award evaluated the effectiveness of the company's efforts to develop and realize the full potential of the work force, including management, and whether it maintained an environment conductive to full participation, quality leadership, and personal and organizational growth (United States Government, 1990).

A total of 150 points out of the total of 1000 were assigned to the Human Resource section in the Baldrige scoring system (U.S. Government, 1990).

Employee Involvement Definition

A working definition of employee involvement (EI) could be: a system of managing people, structures and systems that allow for a level of participation. Employee involvement was based upon the situation/task, the skills of the individuals involved, the willingness of the levels of management to allow participation, and the willingness of the people to participate in the process (Hannah, 1989).

Banas (1983) stated that employee involvement should be defined as a process, not a program. A process that was defined as a series of activities or actions that led to a particular set of outcomes and had

no time boundries. A program was a plan, or schedule, that had a beginning and an end.

Participative management (PM) and employee involvement were two sides of the same coin. Employee involvement was concerned with participation as viewed from an employee perspective; Participative management from a management perspective (Banas, 1983).

Employee involvement had many meanings to many different groups of people. To the NON-SUPERVISORY EMPLOYEE, it meant anything from determining physical environment changes to being involved in and/or making decisions related to the job function. To the LOWER-LEVEL MANAGER, it meant an opportunity to delegate administrative tasks to technical people, or an opportunity for themselves to impact upon decision making. To the MIDDLE MANAGER, employee involvement meant a threat to their position, dependent on the amount of power and decision making currently in place, or it meant an opportunity to enhance their role and position in the organization. For UPPER LEVELS of management, it was seen as a method to stop the passing of "filtered data" along the hierarchical channels, to a complete restructuring of roles, responsibilities, and authorities for the purpose of more accurate efficient decisions and productivity, or perhaps, a scheme to get their decisions implemented through the teams (Hannah, 1989).

Setting the Stage for Employee Involvement

Barner and Fulbright (1991) believed that the success of employee involvement was in the ability to develop an organizational climate that

supported its growth. Managers erroneously believed that employee involvement automatically occurred once employees and managers were trained and learned the benefits of employee involvement. In reality, many resisted because they did not understand their organization's employee involvement goals or their expected roles in the process.

Managers resisted because they viewed employee involvement as a threat to their status and power. In addition, senior managers attempted to implement employee involvement because they wanted to get more out of their employees without truly developing partnerships or a team. Employee involvement would never be successful if viewed simply as an educational or communication program. Before beginning an employee involvement program, management needed to identify any roadblocks that prevented employees and supervisors from committing to full involvement (Barner & Fulbright, 1991).

Employee Involvement-Overall Environment

People were surrounded by news of the reordering of the world. Walls, as well as patterns of behavior and political ideologies, were crumbling. The Eastern bloc countries were learning what the ancient Greeks knew thousands of years ago: decisions made by the many decision makers who were close to the action would always, over time, be better than those dictated from the top down, no matter how brilliant the ruler might have been (Grove, 1991).

People-the Key to Performance

Verespej (1990a) believed that in the 90's people would be the key to the performance and competitiveness of American corporations. The most successful companies would be those that were most committed and creative in responding early to human resource issues.

Grazier (1989) stated that employee involvement was no longer a "nice to do" concept. It was a philosophy of management that must be adopted because management must use all the resources available, especially the human mind, with its infinite capacity for creativity, imagination, and ingenuity, a resource of enormous proportion.

Grazier (1989) continued by stating that Western philosophy said that work existed to provide goods and services, while Eastern philosophy said that work existed to enhance the human spirit.

Verespej (1990a) claimed that people--both managers and workers--would have to grow without promotion, and companies would have to look at paying employees for competency and readiness, rather than their responsibilities. The realities of economic power shifted power from employers to employees.

Empirical evidence suggested that employee involvement had significant benefits for an organization, including reductions in workers' resistance to change, more creative problem solving, increased organizational effectiveness, and--in some circumstances--increased productivity. Further, it was generally assumed that participation had significant benefits for the participators, such as increased job

satisfaction, higher motivation, and greater skills acquisition (Baloff & Doherty, 1990).

It was expected that productivity in employee involvement plants would be 30 to 40% higher than in traditional plants (Garwood, 1990).

Employee Involvement Studies

Numerous studies in the 1960's and 70's found that a participative style lead to less turnover, lower absenteeism and higher levels of job satisfaction. Many who read these studies were ready to assume that higher job satisfaction led to greater productivity, increased profitability and better quality and service, though that might not really be the case (Dulworth, Landen, & Usilander, 1990).

The General Accounting Office (GAO) surveyed 962 FORTUNE 1000 companies in 1987. The result of the poll--which boasted a 52% response rate--showed that the vast majority of the surveyed firms had implemented some form of employee involvement over the last five years. According to the findings, the primary interest of these programs was to improve quality, productivity, employee morale, and motivation (Dulworth et al., 1990).

Changes were occurring in many plants, usually in non-union settings. But this philosophy did not work everywhere. It was pointless in factories with simple repetitive tasks (Cohen, 1990a), because there was no room for creativity or innovation in processes that were simple and engineered for "no-brain operations."

A study of 101 industrial companies found that the participatively managed among them outscored the others on 13 of 14 financial measures. The problem with participative management was that it worked. About 75% of all programs in the early 1980's failed--not because of the workers--but because of management. For as long as participative management had been around--there were experiments as far back as the 1920's--middle managers and foremen had been reluctant to sign on. Managers who thought that their businesses were producing acceptable results were not interested in changing their ways. Fearing a loss of power, many middle managers torpedoed early participative management programs, for the experience had tended to confirm their opposition. The "if-it-ain't-broke-don't-fix-it" notion may have held back U.S. management. The United States was great at maintenance management, and in making small improvements. Why not 40% improvement instead of 10%? Unions, people, and management were NOT ready for participative management (Saporito, 1986).

In a survey of industrial companies with annual sales between $10 and $200 million, more than two-thirds of the 250 respondents stated that lack of productivity in their companies was a problem; that is, their employees were the problem. In the study, 54% blamed people, 27% the process and technology, and 19% plants and equipment (Filipczak et al., 1990).

Cutting costs rarely received much support from the work force itself; it meant, after all, laying off people. However, without active

work force participation, none of the measures needed for effective cost control were easy to implement (Drucker, 1991).

Verespej (1988) believed that democracy and participative management were not the same thing. Democracy was a political philosophy that ascribed power to the people. Participative management was a practical approach to solving problems and achieving performance targets by utilizing people as resources.

In spite of elaborate theories and complex formulas, Aubrey and Felkins (1988) stated that participation was a simple concept based on information sharing, collective decision making, and mutual trust; a concept utilized by an effective management team.

What's Required for Success in American Corporations

In the new era of stiff global competition, American corporations, according to Kizilos (1990), needed to respond much more quickly to market forces. At the same time, mergers and acquisitions and corporate restructuring and downsizing had made the concept of job security almost quaint. If workers felt empowered, the theory stated, they gained a better sense of control over their own lives and might be better able to cope. Empowered people did not view themselves as the victims of circumstance, but as shapers of their own destinies.

Yet, as Kizilos pointed out, some experts cautioned that empowerment was unlikely to prove a panacea for all of corporate America's ills because many corporations did not know what this concept,

empowerment, was all about; they were seeking quick fixes to major corporate culture problems.

Participative management asked people for help, but empowerment was asking them to help themselves.

Kizilos (1990) believed that when an organization paid lip service to the ideas of empowerment, but failed to nurture an environment that supported empowerment, employees could become cynical and withdraw further than ever from aligning with company goals.

Another theory, according to Brown (1989), stated that the key to effectively managing in the 1990's would be the knowing of how to install psychological ownership. Psychological ownership meant that everyone in a business felt a sense of responsibility for what was being done, and employees held themselves duly accountable for delivering whatever an organization pledged. Psychological ownership meant people working "as if they owned the place" (Brown, 1989, p. 47).

Whether one was talking about a successful person or a successful company, there was an inescapable paradox that "nothing fails like success" (Brown, 1991).

Honeywell discovered that the people who made good multifunctional team members tended to be generalists, not specialists. Getting people to work in new ways required some training. In addition to training in empowerment and risk-taking, team members needed to develop problem-solving skills. Communication skills were also vital, especially when one was mixing together people from various disciplines who may not have worked together before and who began with a residue of

suspicion from years of protecting turf, rather than working in synch (Gerber, 1989).

Cox (1991) stated that teams became teams by learning to be teams. Training in teamwork was required. Out of necessity, today's management style was one of quickened response. The need to belong was a powerful human force that found expression in teamwork. "Consensus-seeking was a time-wasting, leveling influence that impeded distinctive performance, yet the Japanese have performed in an outstanding manner utilizing this system. Collaboration without consensus was the soul of competitive advantage" (Cox, 1991, p. 22).

Successful American Organizations

It was no secret that many contemporary American organizations were in trouble. The problem, according to Bradford and Cohen (1984), was not so much obsolete factories, backward technologies, or lazy workers as it was outdated leadership practices. They believed middle and upper managers held the key to high performance in contemporary organizations, since they represented the greatest under-utilization of human resources. Bradford and Cohen wondered what characteristics a truly excellent unit needed. Their studies indicated that members shared a commitment to making the unit extraordinarily successful in accomplishing agreed on objectives. The focus was on quality, on genuinely collaborative team efforts, on confronting differences about work without petty infighting, and on continual attention to the development of members as integral to achieving the task. In this type

of organization, information was freely transmitted among members, as well as between members and the boss. Finally, value was placed on diversity. Cohesion was produced by the commitment to a common goal toward which all worked (Bradford & Cohen, 1984).

The traditional emphasis on control and coordination had validity. The dilemma for the manager was not whether control needed to be exercised, but how to see that it was exercised without weakening the motivation of those with energy and enthusiasm (Bradford & Cohen, 1984).

McKenna (1990) wrote that in order to effect improvement, leaders needed to encourage people "not to check their brains at the door," recognizing that past behavior was not the best predictor of future behavior, and that younger people seemed to accept employee involvement better than older people. Constant improvement was a value that could not be imposed upon people. The only way to get people to adopt constant improvement as a way of life in doing daily business was by empowering them (McKenna, 1990).

People were empowered when they were totally willing and able, committed and competent. The idea of feeling as if one owned a process, a product, a service, a goal, whatever, was intrinsic to the concept of taking responsibility for it (Lee, 1991).

One of the most baffling and hard to solve problems that business executives faced was employee resistance to change. A solution that had become increasingly popular for dealing with resistance to change was to get the people involved, to "participate" in making the change. Participation might never work as long as it was treated as a device to

get other people to do what business leaders wanted them to do. Real participation was based on respect (Lawrence, 1990).

Hannah (1989) believed that it would be ideal if employee involvement systems could be introduced at the moment of an organization's birth. But that was not possible in the case of existing organizations which had already developed a set of operating norms, rituals, symbols, leadership behaviors, structures, and systems.

Many managers had narrow mindedly sought a panacea for their troubles and mistakenly jumped on the bandwagons labeled "automation" or "technology." These managers had dumped thousands, sometimes millions, of dollars into "computer-integrated manufacturing" or robotics or strategic systems, only to find that in the end, people, not machines, made the difference. Technology did not make a business competitive. At best, it provided a short term edge, because the competition found ways of copying it. Companies achieved sustained leadership only from teamwork, excellent communication, common vision of goals, and a dedicated work force (Boudette, 1990).

Types of Employee Involvement Groups

Over the past decade, many forms of participation had emerged around the world. Monge and Miller had created a typology of the four major programs used to increase the amount of worker input into organizational matters (Goldhaver, 1990).

Goldhaver (1990) began by citing the first as the European industrial democracy, which allowed workers to elect representatives who

participated on committees at various levels throughout the organization. This type of program was typically found in West Germany and socialist countries, such as Yugoslavia.

The second type, frequently found in the United States, was the Scanlon System. This system involved the use of employee committees, or work groups, which included workers in everyday decisions regarding innovation within the work place (Goldhaver, 1990).

The third type was the Chinese Down-the-Line program, which was initiated during the cultural revolution in China and was designated to decrease the role of the state in the industrial system and increase worker participation and organizational independence. This form of participation was different to most because the main emphasis was getting higher level employees involved in the work of their subordinates. Workers elected congresses, which represented all demographic types in the work force. These congresses dealt with a wide range of organizational issues, such as the election of managers, performance appraisals, and acceptance of managerial proposals (Goldhaver, 1990).

The last form of participation, quality circles, was originally used in Japan and caught on strongly in the United States (Goldhaver, 1990). The quality circle was a Japanese innovation, circa 1962, that formally mobilized small voluntary teams of workers in order to improve quality and productivity (Schonberger, 1982).

In the early 1980's, quality circles (as they were called in the United States) sprouted in Western industry, especially in North

America. Quality circles were first introduced in America, in 1970, by Lockheed Aircraft, and were patterned after the Japanese groups that dealt with everyday processes. The concept had caught the fancy of the organizational behavior community in the business colleges along with their practitioner counterparts in training and development posts in industry. "Circles" seemed to fit with what had been advocated all along--worker participation and group dynamics (Schonberger, 1982).

The Team Approach

Implementation of the team approach resulted in power redistribution and decisions being made faster at lower levels. Turf issues had disappeared as a concept as teams began more and more to work toward a common purpose (Peterfreund & Peterfreund, 1990).

Self managed teams dramatically boosted the productivity of their companies. Many companies were discovering what may have been the productivity breakthrough for the 1990's, because if one really believed in quality, then when one examined the facts, it was empowering people that led to improvement, and it was empowering people that led to employee involvement teams (Dumaine, 1990b).

Dumaine (1990b) was not referring to the teamwork that was praised at Rotary Club luncheons, or the quality circles so popular in the 80's, where workers gathered once a week to save paper clips or "bitch" about the lighting. What made superteams so controversial was that they ultimately forced managers to do what they had only imagined in their

worse nightmares: give up control--because if superteams worked correctly, they managed themselves.

Dumaine (1990b) continued that superteams were not for everyone. They only made sense if a job entailed a high level of dependency among three or more people. The more complex, the more suited it was for teams.

It was easier to build superteams into a new office or factory than to convert an existing one, Dumaine (1990b) believed. When an operation was starting, a company could screen people carefuly for educational skills and the capacity to work as a team and could train them without worrying about old bad habits such as "it's not my job".

Dumaine (1990b) continued by stating that transforming an old plant could take several years, versus only a year to eighteen months for a new one. There were four team player styles that were critical to the success of any team: CONTRIBUTORS, that brought information; COLLABORATORS, who offered inspiration and a sense of purpose; COMMUNICATORS, who resolved conflict and built consensus; and CHALLENGERS, who questioned goals and methods (Parker, 1989).

Teams as Building Blocks

Leavitt (1975) believed that small groups worked well for people because they satisfied important membership needs, and groups would provide support in times of stress and crisis. Groups were also a good problem finding tool and seemed to be useful in promoting innovation and

creativity. In a wide variety of decision situations, groups made better decisions than individuals.

According to Leavitt (1975), groups were a great tool for implementation because groups gained the commitment from the members so that group decisions were more likely to be willingly carried out. Also, groups would control and discipline individual members in ways that were extremely difficult through more impersonal systems.

As organizations grew larger, small groups were a useful mechanism for fending off many of the negative effects of large size. The difficult question was whether Americans were willing to work in such apparently counter-individualistic units (Leavitt, 1975).

Steps in Launching Employee Teams

The systems described as employee involvement were frequently referred to by other terms, such as, participative management, quality of work life, and employee participation (Dulworth et al., 1990).

Companies reported that the major reason for implementing an employee involvement system was to improve productivity and quality. An overwhelming majority of companies--more than 80%--stated that their employee involvement systems had a positive impact on those performance indicators. About 20% of the companies that responded to the GAO survey stated that they did not have any type of employee involvement system, and the major reason cited was that their cultures were incongruent with participation and involvement principles. Interestingly, 67% also cited this as a major reason behind management skepticism of the impact of

employee involvement on improved organizational performance. The GAO survey suggested that beyond a faulty initial system design or lack of top management support, the inability to integrate employee systems with the organization's primary systems was the main reason for failure (Dulworth et al., 1990).

Dulworth et al. (1990) continued by stating that another reason for failure stemmed from the difficulty in trying to change an organization with an autocratic management style and culture and a hierarchical structure into one with a participative management style and flat structure.

The first year was deemed crucial for any participative process. This was the time for testing, evaluating, and adjusting the program to meet the needs of a particular organization (Aubrey & Felkins, 1988).

Steps in Starting an Employee Involvement System

Eight steps in launching employee involvement systems should be:

1.) Management/union involvement and support required.

2.) Establishment of a steering committee.

3.) Diagnosis of the organization.

4.) Selection of the pilot area.

5.) Preparation of the organization.

6.) Establishment of a local pilot project.

7.) Evaluating and fine tuning initial endeavor.

8.) Generalization and extension.

When creating conditions for large system changes, three factors had proven to be critical: building ownership among line managers, assuring that adequate resources were available for the change effort, and the dissemination of learning (Walsh, 1984).

Stokes (1990) stated that for a group to become a team, two dynamics must be present--team members must understand, accept, and be committed to a common mission, and team members must understand that they need each other to accomplish that mission and behave accordingly.

Employee Involvement's Role in Enhancing Productivity

Perkins (1990) stated that a company's human resources were a competitive weapon. There was an awareness that well trained, highly motivated employees really could make a difference in terms of improved productivity, and improved quality.

Experts believed that the single most significant determinant in maintaining a country's standard of living was productivity growth. Since the growth of productivity in America was last among the industrialized nations of the world, the experts again stated that the standard of living in the United States was declining and would continue declining as long as this problem persisted (Grazier, 1989).

Grazier (1989) continued by stating that to survive and maintain our way of life, the American workforce must change the way it worked. Workers, including management, needed to renew the sense of purpose, and needed to instill in all a sense of urgency about productivity. People needed to place responsibility for the success of organizations on ALL

employees, not just a handful of managers. It should be recognized and understood that if ALL employees were responsible, then ALL employees should be more involved in the organization.

Imai (1986) believed that in order to improve productivity, the first step was to ensure the cooperation and commitment of the workers. It was important to obtain labor's explicit understanding of and commitment to, the idea that productivity improvement was mutually beneficial.

Adam Smith concluded 200 years ago that high productivity labor required a century or more of indoctrination and perfection of skills. And what was called "management"--the capacity to integrate working individuals into a social organization and to plan, finance, and market--Adam Smith thought took even longer to develop. Until quite recently, all historical experience supported Smith's conclusions. Now, however, low wages and high productivity were not seen as a unique product/element (Drucker, 1987).

Learning from Our Competitors

In the 1990's, the country that taught the world how to manage needed to take some lessons from others. Success depended on how the work was organized, how inventories were monitored, and dozens of other managerial decisions. Managers had to redesign the workplace and eliminate layers of bureaucracy to permit workers to adapt to new technologies more readily. As the American work force manipulated information and knowledge more than actual products, traditional command

and control methods of "supporting the troops" were rendered obsolete (Mandel & Pennar, 1989).

Most employees did not believe their work was being properly rewarded and believed that their companies were not doing enough to attract high quality performers, not doing enough to train them, nor manage them effectively (Gelfong & Grey, 1990).

An unwritten contract allowed companies to secure worker loyalty and performance in exchange for the promise of continued employment and a fair day's pay. Dynamic forces in the business environment had fundamentally reshaped the traditional contract, forces such as competition, technology, decentralized organizations, and deregulation (Gelfong & Grey, 1990).

Practices at successful companies had revealed distinct relationships between human resources practices and improved performance. Successful companies placed greater emphasis on pay for performance, training, and career development. European companies motivated more by involvement and identification; North Americans more by pressure and extrinsic rewards. If organizations were to respond successfuly to the needs of their employees, they needed to ensure that their corporate beliefs and value systems were aligned with the predominant values of their work force (Gelfong & Grey, 1990).

Pay As a Motivator-A Myth Destroyed

When pay was mentioned in connection with studies, it was usually pointed out that studies showed the relative unimportance of pay in

comparison to such things as interpersonal rewards and group norms. This conclusion was wrong, and it was unfortunate that it was widely accepted. When employees did not trust management, instead of believing that good performance would lead to higher pay, they believed that it would lead to higher standards (Lawler, 1975).

Employees developed norms against high production, punished good performers, and provided management with false data about performance in order to protect themselves from having to work harder in order to make the same money (Lawler, 1975).

Items to Consider for Improved Performance

Franco (1991) stated that most companies were starting to believe that competitive success hinged on the abilities of their people, pure and simple.

Blanchard (1991) taught that the important points necessary to improve employee and organizational performance were captured with the acronym PRICE: pinpoint, record, involve, coach and evaluate.

Hellervik (1991) stated that the quality of executive leadership was a crucial factor in improving performance. The skills that led middle management to be successful could become an obstacle to executive effectiveness.

People were motivated by physical, social, and emotional needs, not monetary ones as believed by many authoritarian managers (McGrath, 1985), a view disputed by Lawler (1975).

One kept hearing that the work ethic in America was dead. In a national poll conducted by PSYCHOLOGY TODAY, Daniel Yankelovich found that the work ethic was alive, but that people were increasingly dissatisfied with the way their work was being organized and managed. The respondents felt that they were laboring for someone else's benefit, more than for their own, so they were not working any harder than necessary to keep their jobs (Davies, 1988).

Summary

The first two decades after World War II were eras of strong growth for United States productivity. The next two decades were eras of strong growth for analysis of American productivity. The productivity growth had dropped to about one percent a year, and observers started looking for solutions to the productivity problem. A major cause of the productivity slowdown, according to a 1979 FORTUNE article, was that business investment grew a feeble 1.4% annually from 1973 to 1978, compared with 3.9% from 1947 to 1973. Conservatives pointed to excessive regulation, environmental laws, and affirmative action as the causes for the poor productivity performance. Liberals blamed high military spending. Almost everyone could join ranks against too many lawyers (Schlefer, 1989).

The MIT Commission concluded that the American productive system was not being eroded but had, itself, become obsolete. Mass production, once a powerful engine of growth, now perversely impaired American industry. In a competitive world where customers demanded high quality

specialized products, American firms needed to regain traditions of custom tailoring (Schlefer, 1989).

Appendix A has a more detailed evaluation and history of the manufacturing system in the United States and its effect on employee productivity and motivation.

"We focus on capital investment as a way to reduce labor ignoring the huge benefits to be gained from improved quality, reduced inventories, and faster introduction of new products. All the fuss is because rising productivity is the lever of economic development and growth. It provides what economists call 'costless' growth. When labor and capital, the two key factors of production, are most productive, the economy is performing at its optimum" (Pennar, 1988, p. 100).

Hout and Stalg (1990) believed that forming teams might not produce time compression in companies. They continued by stating that implementing teams without changing the embedded work routines and management practices would not compress time. Leading companies' time management represented the most powerful new source of competitive advantage.

The problem of declining productivity and work performance started slowly several years ago and had not vanished. If anything, it had worsened to the point that it was causing ever-increasing concern to companies, the government, and to most responsible Americans. During the past decade, wages had increased at an annual rate of 8.2%, while productivity growth had been limited to only 1.3%. BUSINESS WEEK estimated that the loss of competitiveness by American industry in

recent years equals $125 billion in lost production and some two million lost jobs (Stanton, 1983).

Employee Involvement Results

Verespej (1990a) reported that a survey of nearly 500 major businesses, by the American Productivity & Quality Center, found that more than 80% of them had some type of employee involvement program, but only 25% had significantly changed the way most of their employees are managed.

Sheridan stated "productivity-improvement/cost reduction efforts utilize the sensible use of advanced technologies--such as computer integrated manufacturing (CIM), simultaneous engineering to shorten the design to manufacturing cycle, flexible equipment and people, solid on time delivery performance, extensive employee training, and partnership ties with suppliers and customers alike. But the most important element was good people management--the ability to build trust and unleash the full potential of a well trained, dedicated work force" (Sheridan, 1990, p. 27).

Appendix B contains documented examples of results experienced by eight major corporations, and others, that have implemented employee involvement and participative management practices.

After evaluating the results that have been published and portrayed in Appendix B, one must agree that the results are spectacular. One has to wonder why all enterprises have not implemented this new management/employee approach. Perhaps, as postulated in the null

hypothesis, there were other factors that were driving these results and perhaps, leadership and good management practices are just as successful as the highly touted employee involvement approach.

Problems Associated With the Employee Involvement Approach

Problems as Viewed by the Individual

The potential problems of using employee involvement had received much less attention in the literature than had the benefits, according to Baloff and Doherty (1990). When these problems were discussed, they were always viewed from the perspective of the organization. Very little had been written about the personal problems of the participants. Negative consequences could be experienced, especially during the initial start-up period. First, participants may be subjected to peer group pressure against what was seen as collaboration with management. Second, the participators' managers may attempt to coerce the participators during participation, or retaliate if the managers were displeased with the outcome. Third, participators had difficulty adjusting at the end of a participatory experience when they were thrust back into narrow, rigidly traditional tasks. Accumulation of these types of problems could undermine an entire program (Baloff & Doherty, 1990).

Lack of Implementation in Japanese Owned Plants

In spite of all the Western enthusiasm for quality circles (and their wide use in Japan), Japanese subsidiary plants in the West, generally, had not implemented them. Juran stated that quality circles, which he favored for their human relations benefits, could deal with the numerous small problems, but the major quality matters were related to vendor relations, management policies, process designs, and other areas outside the workers' sphere of influence (Schonberger, 1982).

Junji Noguchi, general manager of the Union of Japanese Scientists and Engineers, stated that "workers and foremen could solve only 15% of all quality control problems. The rest must be handled by management or the engineering staff" (Schonberger, 1982, p. 164).

Productivity Study

Harrison (1991) claimed that no single idea about reorganizing the workplace spread so rapidly during the past decade as that of employee involvement. By 1987, half of all metal-working establishments in the United States had instituted labor-management problem solving committees. Workers had embraced these innovative activities for a number of reasons, ranging from relief of boredom to the hope of gaining new respect from supervisors. But managers flocked to employee involvement for its promise of greater productivity--and by that standard, employee involvement had not delivered.

Harrison studied more than 1,000 plants belonging to companies of varying size, some with and some without the joint committees. The companies encompassed 21 industries in the United States metal-working sector. The study found that employee involvement not only failed to help efficiency but, actually appeared to hurt it. Among smaller companies (those with single plants), the ones that had created employee participation committees were a quarter less efficient than those that had not taken the trouble. Among the larger companies, plants that had the committees were 46% less efficient (Harrison, 1991).

Harrison (1991), in his study, asked why employee involvement was not delivering the results. One possibility was that plants were already in trouble and adopted employee involvement for that reason. But, fully 70 percent of the corporate branch plants already had employee involvement. It was possible that workers still did not trust management initiated programs, and were not yet willing to share the knowledge on which workers believed their job security depended.

Employee Involvement and American Industry

Peters (1987) stated that the average American worker was over supervised. The average span of control in the United States was one supervisor to every ten non-supervisors. In Japan, the average span of control in an auto plant was one to 150. The winning organizations should add value with people involvement, the losing organizations continue to replace people with machines.

The skills that were required for the would be participative manager--communicating, motivating, and championing ideas--"are sandy intrusions in the gearbox of many traditional executives." The "if it ain't broke don't fix it" notion might be holding back American management (Harrison, 1991, p. 74).

Day (1990) believed that participative management was about to face its stiffest test since the concept became fashionable in the early 1980s: overcoming a stagnant economy. One could speculate whether participative management would have gained strength, legitimacy, and the momentum it now enjoys without the benefit of a strong, resilient economy. Numerous participative management triumphs had been solid. In fact, they had unwittingly created an unrealistic expectation: that worker-manager collaboration would magically solve every dilemma imaginable.

Day (1990) continued by stating that participative management was a fragile concept. Nothing irritated or frustrated supervisors more than employees who ignored their authority and appealed directly to employee involvement forums to resolve routine problems. It should be recognized that not every idea submitted under the collaboration banner had merit.

Some Perceptions of Employee Involvement

Motivationalists had stressed that most people had a strong need to plan, organize, and control their work, and needed to have more of a participative input into matters that affected them on their jobs. However, not everyone had the ability, intelligence, or experience-- or

for that matter, the desire--to engage in such functions. To categorically expect all employees to engage in participative management was completely unrealistic and may even have invited chaos into the work place (Stanton, 1983).

Attitudes had continued to change regarding work, and many people simply did not want to work hard any longer. The relative affluence that our country had enjoyed for many years gave rise to a preoccupation with the self, a dramatic rise in self indulgence, and an increased emphasis on instant gratification, and the pursuit of pleasure seeking activities--accompanied by a decline in commitment to work. Described another way, society "owed" people certain privileges--a good comfortable job and high income--the "psychology of entitlement." In short, many people had become fat, lazy, and complacent (Stanton, 1983, p. 212).

Two Examples of Employee Involvement's Failure

An example of problems experienced with work groups and employee involvement was best illustrated with an example from an Eastern bloc country:

The workers of Yugoslavia took charge ages ago and had been in charge so long that some are tired of working for themselves. A movement had actually begun to hand power back to managers (Newman, 1987).

"The factories belong to the workers," Tito exulted when the idea was brought to him in 1949. The Yugoslavs call this "our socialistic

system of self-management." This self management was a source of national pride. Workers controlled everything, everything except the army. "And what do workers do when they run the show? If the pride of the Yugoslavs provide any pointers, the one thing they didn't do was invest their profits. They did award themselves fat raises. Then they borrowed. And when debt ruined the economy, inflation topped 85% and their buying power collapsed--they struck" (Newman, 1987, p. 45).

The workers and bureaucrats blamed the party, the party and the workers blamed the bureaucrats, and, naturally, the bureaucrats and the party blamed the workers. Apart from raising pay, hiring was the executive act workers relished most. (They rarely fired anyone.) The workers decided that self management had to be stopped because the workers could not implement the decisions that had to be made in order to have a viable enterprise (Newman, 1987).

Another example of problems associated with employee involvement was the data from the Wiring Room study which uncovered the fact that high performers were being held back by the other members of the group who feared that all members of the group would be expected to produce at the high performers rates. While this did not constitute negative evidence for Theory Y, it appeared that it did constitute negative evidence for employee involvement because in all the situations described in this study, employee involvement methods might not work at all. This was the only example of an outright conflicting interpretation of the meaning of the Hawthorne Studies (Lorsch, 1975).

Summary

All too often, corporate leaders had read the success stories and ordained that their companies adopt work teams--NOW. So, perhaps, the first lesson needed to be that companies not plunge headfirst into this approach (Verespej, 1990b).

Just as American firms were trying to implement Japanese management systems, Honda was centralizing. Nobuhiko Kawamoto, the president of Honda Motor Company since last June, was shaking up Honda's quirky corporate culture. Honda had gotten conservative and sluggish, he believed, it had simply grown too big for democracy. The Japanese company was charting a new course that emphasizes more individual responsibility for decisions. Honda was trying to become a flexible, responsive big company, instead of a flexible little company. Honda's top three executives stated that they would not completely abandon the "Republican" system but believed that it had been carried too far--too many things were done in groups--Honda's management had lost a sense of responsibility; the feeling that every individual had his own specific duties. Now, senior executives would get direct line responibilities and be held accountable (Chandler & Ingrassia, 1991).

The virtues of employee involvement, defined broadly as a manager sharing decision making with subordinates, had been promoted enthusiastically in recent years. However, among senior executives, if one pays more attention to their actions than their speeches, the national love affair with employee involvement was less passionate. It

might be hard to find many executives who spoke out against it, but the realities of politics and power enabled few to practice it consistently. In theory, "Employee involvement had three basic virtues:

1.) The premise that several heads were better than one, 2.) the premise that a consensus decision was likely to be carried out more enthusiastically, and 3.) the premise that participation in decision making was effective on the job training that helped develop subordinates" (Herman, 1989, p. 54).

Herman (1989) continued by stating that managers contemplating the notion of adopting a more participative style should consider the following:

1.) Not introduce employee involvement when radical changes were needed quickly, 2.) seldom economical to try and build a participative team out of people who interacted only occasionally, 3.) participation was only conversation unless it produced action, 4.) effective employee participation did not always require final decision making, and 5.) not ask for participation in making a decision if the decision had already been made, 6.) ask, instead, how to make it work (Herman, 1989, p. 55).

"Managers complained that groups were slow, and that they diffused responsibility, vitiated the power of the hierarchy because they were too democratic and created small, in-group empires which were very hard for others to penetrate" (Leavitt, 1975, p. 69).

As it had been practiced, "participation" had not thrown off its heroic orientation. Second, much participation had focused on the least important issues, instead of letting the group become involved with the

major issues that are troubling organizations. Finally, managers were inclined to use participation as a way of gaining acceptance for their own ideas and solutions, rather than utilizing the talents of the subordinates (Bradford & Cohen, 1984).

Management Problems Associated With Employee Involvement

Current Managerial Practices

Botkin, Dimancescu, and Stata (1984) asked whether corporate managers had not understood the importance of motivating workers and assisting them. One answer could be found in the Business Schools, where an elitist attitude about managing was inculcated in students. High salaries, much responsibility, and little contact with workers were the symbols of the MBA success. Worse, the MBA expected them as conditions of work--and got them. Another answer came from the corporate culture itself. Rewards and status, which were symbols of achievement, induced managers to behave as "managers." Delegating and controlling were more valued than participating and sharing of responsibility.

Marrow (1975) believed that the leaders of organizations recognized that the present work force was better educated, more affluent, and brought greater expectations for self management and self actualization to the job. However, they had effected only minor changes in their managerial practices. Most had continued the traditional procedures which reinforced decision making at the top and denied the employees'

potential for responsibility, creativity and productivity. This was still acceptable to many older employees who had become accustomed to thinking in terms of economic rewards. But the young people did not share these material values. Money was important but not at the expense of the lifestyle they wanted.

Marrow (1975) continued by stating that employees were unwilling to subordinate their personal wants and desires to meet the needs of the organization. The employees were prepared to risk economic penalties for taking days off, shifting jobs or engaging in sabotage.

Marrow (1975) claimed that industry was overmanaged and overcontrolled. Employees in the future were even less likely to accept rigid controls than they do now. Young employees no longer believed that hard work pays off. They had a different notion of success. These employees were not willing to make personal sacrifices for economic security if it did not bring self fulfillment as well.

The New Wave of Management Thinking

Toffler (1990) stated that regulations that were endorsed by the majority of the workforce had a chance of being implemented. But, to invite the workers into the rule making process was to share power with them, a shift not all managers found easy to accept.

Grove (1991) believed that decisions arrived at by decision makers close to the action, not a central source, was the focus of a new wave in management thinking: employee empowerment. The idea sounded appealing, and it was easy to accept in theory. But despite all the

talk, it was very hard to practice. Mainly, because it required that the boss wanted to LEARN.

According to O'Connor (1990), the biggest mistake management made when implementing the team player concept was that working toward a common goal, somehow, leveled out the difference between good and poor performance. Often, managers and supervisors made it very clear that they were only concerned with the end result, and since the end result was a "team" effort, good performance was less rewarded, and poor performance was often left entirely unnoticed. The team player concept received a second strike because employees did not believe in it, and did not trust what management told them. Strike three was that top management considered the team approach the panacea for what ailed organizations and did not remedy what was causing the deficiencies.

Resistance to Employee Involvement Systems

Cole and Tachiki (1984) pointed out that resistance to worker involvement was real. Resistance was a phenomenon that was credited with the failure of many efforts since the concept was introduced in 1970. Within the organization there were three potential areas of resistance: the work force, management, and the union. Studies in recent years had shown that the most significant area of resistance was management. A 1982 study of 218 early adaptors of Quality Circles concluded that middle management resistance (79%) and lack of top management support (71%) were the top two factors hindering the spread of quality circles in their firms.

Managers were the single biggest obstacle according to Lee (1990) because smoothly functioning work teams would gradually assume most of the supervisor's responsibilities.

Klein (1984) believed that in the work force, the resistance was caused by the credibility gap with management. Employees simply did not believe management was serious, because they had seen programs come and go. With union leadership, the resistance stemmed from its adversarial position with management. But, management resistance was more serious because management held the key to implementation and sustaining any change in the organization. They were the leaders, the models of how the organization should operate.

Summary

A natural step toward lessening management ranks was to create a more competent work force. Klein (1984) claimed that in a survey of first line supervisors conducted by the Harvard Business School, nearly three-fourths (72%) of the first-line managers surveyed viewed employee involvement as being good for the company, and more than half (60%) felt it was good for employees, but less than one-third (31%) viewed it as being beneficial for themselves.

Call it employee involvement, or worker participation, or labor-management "jointness." Whatever the term, the concept had clearly troubled many Americans. Employee involvement gave managers a powerful tool to improve productivity and quality, but it could undermine their control. While many union officers still rallied

against participation, more and more workers were willing to risk employee involvement in the hope of making their employers more competitive--and their jobs more secure (Hoerr, 1989).

Failures of Employee Involvement Endeavors

Smither (1991) stated that the secret was this: teamwork was out, authoritarian leadership was in. To the chagrin of some managers, and to the relief of others, evidence was accumulating that many of those quality circles, "high performance teams", and autonomous work groups were not living up to expectations. Although researchers in academia had suspected this for at least ten years, only recently it had been depicted in the popular press. In its April 1, 1991 issue, BUSINESS WEEK published an item that stated that the productivity of the above mentioned groups were often unimpressive. Less than two weeks later, THE WALL STREET JOURNAL carried a story describing how Honda and other Japanese companies were moving away from teamwork and toward centralized management.

Smither (1991) continued by citing that just as American firms were trying Japanese management styles, Honda was centralizing. Kawamoto, Honda CEO, found teamwork was no longer enough to boost market share. Honda had gotten conservative and sluggish because it had grown too big for democracy. The Japanese company was charting a new course that emphasized more individual responsibility for decisions. "We've done too many things in groups, we've lost a sense of responsibility" (Smither, 1991, p. 42).

Grazier (1989) cited a survey of employee involvement programs around the country that revealed that most efforts failed within a year of implementation. Many reasons were presented, but the leading cause of failure was insufficient management commitment and support.

Authoritarian management had been characterized by a strict reliance on roles. Managers made decisions, subordinates carried them out. Authoritarian managers may rely on punishment to motivate, but they were just as likely to rely on rewards. The important thing to remember was that what defined authoritarianism was not punitiveness but where the decision making authority rested. Stripped of its ideology, authoritarian management was simply the practice of taking ultimate responsibility for both decisions and control of subordinate performance (Smither, 1991).

Smither (1991) continued by stating that authoritarian management was not for everyone. It would not work if people felt strongly about having a say in decision making or if managers were more comfortable with employee participation in decision making. Some cases in which authoritarian management was most likely to work:

1.) Where employees were poorly educated or uninterested in either responsibility or the organizational mission.

2.) When productivity was more important than employee satisfaction.

3.) When focus of performance was short-term rather than long-term.

4.) When the manager was comfortable with a directive style.

5.) When the emotional ties were strong enough between leaders and followers so that workers would not resent strong direction.

"Authoritarian" was not necessarily a synonym for oppressive or punitive management. There was no reason to believe that people who prefer to work in authoritarian environments were "psychological mutants" (Smither, 1991, p. 43).

Smither (1991) believed that there were no causes to assume that teamwork or quality circles in themselves would result in higher productivity or greater job satisfaction. The crucial factor was the leader-follower bond. While it was true that some leaders could make teamwork succeed among their subordinates, it was equally true that some workers would rather rely on their leaders--not their co-workers--for guidance on the job (Smither, 1991).

Miller (1991) stated that a fairly consistent finding in the study was that employee involvement systems had either no effect or a perverse effect on productivity. "Although employee involvement makes workers and managers 'feel good', it was largely irrelevant to productivity" (Miller, 1991, p. 24).

Summary

Nussbaum (1988) stated that the nation's ability to compete would be threatened by inadequate investment in our most important resource: people. The nation would be facing a monumental mismatch between jobs and the ability of Americans to do them in the year 2000 (Bernstein, 1988).

Employee involvement proponents believed that employee involvement systems could bridge the gap and empirical evidence suggested that employee involvement had significant benefits for an organization, including reductions in workers' resistance to change, more creative problem solving, increased organizational effectiveness, and increased productivity. In addition, participation increased job satisfaction, resulted in higher motivation, and greater skills acquisition (Baloff & Doherty, 1990).

Dulworth et al. (1990) believed that a participative style lead to less turnover, lower absenteeism and higher levels of job satisfaction. Employee involvement was a way of not only improving attitudes but also of making an improvement in costs (Bennett, 1990).

A study of 101 companies found that the participatively managed outscored the others on thirteen of fourteen financial measures (Saporito, 1986), and it was expected that productivity in employee involvement plants would be thirty to forty percent higher than in traditional ones (Garwood, 1990).

Companies reported that the major reason for implementing an employee involvement system was to improve productivity and quality. An overwhelming majority of companies, more than eighty percent, stated that their employee involvement systems had a positive impact on those performance indicators (Dulworth et al., 1990).

Grazier (1989) stated that employee involvement was no longer a "nice to do" concept. It was a philosophy of management that must be adopted because management must use all of the resources available,

especially the human mind, with its infinite capacity for creativity, imagination, ingenuity, and adaptability to change.

In spite of elaborate theories and complex formulas, Aubrey and Felkins (1988) stated that participation was a simple concept based on information sharing, collective decision making, and mutual trust; a concept utilized by an effective management team.

The keys to implementation were education and management commitment (Collitti, 1986). Decisions made by the many decision makes who were close to the action would always be better than those dictated from the top down, no matter how brilliant the ruler might have been (Grove, 1991).

In spite of all the Western enthusiasm for quality circles (and their wide use in Japan), Japanese subsidiary plants in the West, generally, had not implemented them. Juran stated that quality circles, which he favored for their human relations benefits, could deal with the numerous small problems, but the major quality matters were outside the worker's sphere of influence (Schonberger, 1982).

Motivationalists had stressed that most people had a strong need to plan, organize, and control their work, and needed to have more of a participative input into matters that affected them on their jobs. However, not everyone had the ability, intelligence, or the experience, or for that matter the desire to engage in such functions (Stanton, 1983).

Smither (1991) believed that there were no causes to assume that teamwork or quality circles in themselves would result in higher

productivity or greater job satisfaction. While it was true that some leaders could make teamwork succeed among their subordinates, it was equally true that some workers would rather rely on their leaders, not their co-workers, for guidance on the job.

All too often, corporate leaders had read the success stories and ordained that their companies adopt work teams NOW. So perhaps, the first lesson needed to be that companies not plunge headfirst into this approach (Verespej, 1990b).

Managers flocked to employee involvement for its promise of greater productivity, and by that standard, employee involvement has not delivered (Harrison, 1991).

Smither (1991) stated that the secret was this: teamwork was out, authoritarian leadership was in. To the chagrin of some managers, and to the relief of others, evidence was accumulating that many of those quality circles, high performance teams, and autonomous work groups were not living up to expectations. Although researches in academia had suspected this for at least ten years, only recently it had been depicted in the popular press. Just as American firms had tried to implement Japanese management systems, Honda had centralizing because they had grown too big for democracy and were charting a path that emphasized more individual responsibility (Chandler & Ingrassia, 1991).

Grazier (1989) claimed that most businesses had been profitable and successful and believed that most Americans had enjoyed a reasonably comfortable standard of living. Because of that, he believed that there

had been no motivation to change the way people worked and behaved in our society.

The literature search confirmed that there was no consensus or clear cut data to substantiate that employee involvement systems improved productivity or enhanced financial performance.

CHAPTER III

METHODOLOGY

The purpose of this study was to compare the level of performance of employee involvement teams to that of traditionally supervised employees doing the same type of work. This chapter includes the methodology used to design the study, collect, and analyze the data. The following sections include: (1) introduction, (2) population, (3) subjects, (4) the treatment-independent variable, (5) team dynamics, (6) research hypothesis, (7) type of research conducted, (8) data collection procedures, and (9) statistical analysis.

Introduction

The management of the study organization believed that the next great breakthrough in productivity required employee involvement. The subject organization had attained and maintained constant financial improvements, in excess of ten percent per year, during the last seven years. The leaders of this organization believed that in order to continue to be on the leading edge as a manufacturing entity and to remain competitive, more direct employee involvement was required.

The employee involvement process began in August of 1989. The process put in place a plan to enact culture change, improve quality,

improve employee morale and improve productivity. The implementation plan that was enacted was seven to ten years in length.

Population

There were approximately 3250 production employees in the total population with 2125 involved in this study. The study utilized one control group made up of 250 subjects and seven treatment groups made up of 1875. The seven treatment groups were combined into one group in order to achieve the parameters required for a valid statistical study. The employee involvement teams consisted of eight to thirty seven teams internally within each treatment group.

There were 715 subjects excluded from the overall study because they worked on machine controlled operations, discontinued products, jobs that were being consolidated, or repair operations that were not rated. There were another 410 employees that had not received the treatment and thus were not included in the study.

Therefore, the valid population consisted of 2535 employees/subjects of which 410 were excluded because they had not received the treatment and were not required for additional control teams, an 84% employee participation rate when compared to the valid population.

Selection Of Study Groups

One hundred percent of the employees who received the treatment were included in the study, (1875 subjects). The treatment/training was

administered to the employees by group and the groups were selected for the training by organization number, lowest to highest.

The control group of 250 subjects had been selected because they had not received treatment, were not considered to be a major problem area, had been running relatively on schedule, and the management of the overall organization believed that the control group's managers were sound and could be utilized for this study as the controlling entity.

In summary, the study included 84% of the valid population (2125 out of 2535 subjects). A more detailed presentation of the subject population was presented in Appendix C.

The employee involvement teams were formed from people who attended the training class (treatment) and who volunteered to become involved members of the team.

Prior to the inception of the employee involvement process, which began in August of 1989 and to the training, there were no employee involvement teams in the organization.

The Treatment

The training (treatment) was a five day workshop that dealt with team concepts, and culture required to support those concepts. It also put in place a process that allowed total voluntary involvement.

Class participants were a mix of managers, engineers and operatives. After the basic courses, additional training was voluntary and included how to run a meeting, electronic mail, networking, problem solving methodology and awareness sessions.

Training was needed to provide 1.) new job skills, 2.) team building, 3.) problem solving, 4.) conflict resolution, and 5.) communication skills.

Supervisory training was deemed to be the most critical and therefore, over 60 hours of mandated courses relating to leadership, coaching, and empowerment was added to the basic treatment.

Team Dynamics

The team was made-up of volunteers, usually six to twelve, who held short weekly meetings to improve their workplace quality and productivity.

A leader and recorder were elected by the team and the supervisor and engineer(s), as team members, met with the team to help the team expedite issues and improvements.

A facilitator was assigned to each team. The facilitator participated with the team to insure the meeting process, kept the team focused on workplace issues, nurtured the team's growth, and helped to expedite quality issues and improvements by overcoming roadblocks.

The facilitator's role was to monitor, coach, and network. Facilitators were selected from supervision and engineering and major emphasis was placed on the facilitators being top performers.

The team's purpose was to enact a culture change by developing and enhancing the skills of every employee. In addition, the team's goal was to involve the employees in decision-making and continuous improvement, to gain a strategic competitive advantage for the factory.

With proper implementation, it was believed that teams would be an important tool to reduce labor costs, make improvements in quality, improve productivity and morale, and create a sense of ownership and commitment to the product and to the workplace.

The teams focused on the process, quality and safety. The teams did not address issues relating to company rules or the labor contract.

Team members volunteered to start up an employee involvement team, after training had been completed. The team was self directed--the team elected their own leaders, chose the ideas or problems to work on, met for thirty minutes each week, and were allowed time outside of team meetings, during the standard work shift, to seek solutions.

Team goals were to: 1.) provide a process of employee involvement that would reach 100% of the employees, 2.) empower employees to take responsibility and ownership of their processes and quality, 3.) enhance the quality of the entire factory, 4.) improve employee morale and attitude, 5.) achieve a competitive advantage for the factory, 6.) enhance the communication channels throughout the factory, and 7.) develop employee skill levels through training.

A visible account of team progress was kept in the workplace on a flip chart and a history of the team's activity was kept by the recorder. The team usually only had six to eight open items, problems that they had addressed, at any given time and total employee involvement was achieved by allowing all employees an opportunity to participate on the team.

Research Hypothesis

The null hypothesis was that there was no significant difference between the levels of performance of the employee involvement teams and those of traditionally supervised employees performing electronic assembly operations at a major manufacturing facility.

Type of Research Conducted

The study utilized a quasi-experimental design, a form of correlation research that resembles an experiment. Because of this resemblance, and unlike other forms of correlation design, conclusions can be drawn from the results (Abbott & Bordens, 1988).

The main feature of quasi-experimental research was that it makes use of naturally occurring groups of subjects. Because naturally occuring groups were used, one does not randomly assign subjects to treatment conditions as one would in a true experiment. "The main difference between the true experiment and quasi-experiment was in the subject selection and assignment" (Abbott & Bordens, 1988, p. 161).

This quasi-experiment utilized a time series design as suggested by Campbell and Stanley (1963).

<u>Quasi-Experiment</u>

O	X	O	O	Treatment Group
O		O	O	Control Group

In the time series design (Campbell & Stanley, 1963), one makes several observations (O) of behavior over time prior to and immediately after introducing the independent variable (X), the treatment. A contrast is then made between pre-intervention and post-intervention performance.

The major problems associated with this type of design were related to internal validity. A partial solution to this type of problem was to include a control group in the quasi-experiment (Abbott & Bordens, 1988), which was done in this study.

Data Collection Procedures

The study collected data from actual auditable accounting results that were generated by the study groups and the results were reported on a monthly, quarterly and yearly basis. The study was conducted over a two and a half year period, starting with the end of 1989.

The dependent variables that were tracked and evaluated by the study consisted of variables that could be influenced, to some extent, by the employees in the groups. These variables were: 1.) labor productivity- a ratio that is based upon "should take" time compared against actual time it takes to accomplish the assigned task, 2.) results- a measure of total standard costs compared to actual incurred costs, 3.) work days lost (annualized), 4.) expense supplies, 5.) total group expenses, and 6.) a quality index- the ratio of customer standard quality compared to actual audited results.

A more detailed explanation of the dependent variables follow:

1. Labor productivity- This metric was determined by comparing the actual time it takes to assemble products by the group, and comparing the actual incurred time to an established standard that has been predetermined by industrial engineers. The predetermined standard was established by time and motion studies, machine cycle times, and pre-established industrial engineering guidelines that have been refined since the Hawthorne studies. The actual calculation is made by placing the established standard time (the recovery hours) in the numerator and dividing by the actual incurred time (denominator) to produce the product. The resulting ratio is an efficiency percent that can be tracked and evaluated. It was expected that the groups would attain 100%, however, it was important to track trends in addition to evaluating the absolute result obtained by the above productivity metric.

2. Results- This metric could be viewed as a profit or loss evaluation. However, the results of this manufacturing entity were cost based and therefore, it was a comparison of the recovered standard costs to the incurred costs of producing the product. The resulting dollar number was either positive, indicating that it cost less to produce the products in question and that a positive dollar contribution was made to the business, or a negative number which would indicate that it has cost more to produce the product than the established standard.

3. Work days lost (annualized)- A calculation of the number of sick absence days incurred during the period. This metric was evaluated because experts felt that employee involvement systems promote employee

motivativation and interest, therefore, motivated employees have less occurrences of absence (Dulworth et al., 1990).

4. Expense supplies- Dollars associated with production that are expensed in the current accounting period. An example of items that were included in this variable were packing materials, solder, labels, and stationary items. It was believed that this was an item of cost that employee involvement groups would address and could impact.

5. Total group expenses- This variable included all of the expenses associated with production. The metric included expense supplies which were evaluated as part of this study, in addition to others associated with producing the product such as salaries and wages, depreciation and maintenance expense.

6. Quality index- This was a comparison or ratio of incurred defects, workmanship or test, to established customer standards. The customer standards were established by industry studies and customer expectations based upon the technology utilized. It was expected that this metric would be below 1.00, which was considered standard quality.

Statistical Analysis

The study analyzed the six dependent variables before and after treatment and reached a conclusion about the effectiveness of employee involvement groups versus traditionally managed work groups.

The study utilized one of the most widespread experimental designs in educational research, one that involves an experimental group and a

control group both given a pre-test and post-test and one where groups constitute naturally assembled collectives (Campbell & Stanley, 1963).

The t-test was used to evaluate and compare the two groups, control and treatment. The t-test was selected because groups were the unit of measure not individual subjects. Also, the t-test can be used if there are an unequal number of subjects per group, as there are in this case (Abbott & Bordens, 1988).

The chi-square analysis was also utilized to compare if differences exist between groups, as recommended by Witt (1985).

A trend analysis or forecast was run using the time series data that was available from the study and it utilized a least squares and regression analysis approach.

CHAPTER IV

PRESENTATION OF FINDINGS

The purpose of this study was to compare the levels of performance of employee involvement teams to those of traditionally supervised employees doing the same work.

This chapter is devoted to the presentation of the study findings. It is comprised of the following sections: (1) the description of the statistical techniques employed for analyzing the data, (2) analysis and results of the study, which were further broken down by descriptive statistics, hypothesis tests, and projections of future productivity, and (3) summary.

Statistical Techniques Employed

The study utilized a pre-test post-test control group design, as recommended by Campbell and Stanley (1963), and incorporated a quasi-experimental approach, which was dictated by the natural groups investigated by this study.

The design dictated that, since groups had been the unit of measure in this study, and since the study contrasted differences between two groups, treatment and control, the "critical ratio" or t-test was the statistic of choice, in spite of the large individual sample size (Campbell & Stanley, 1963).

Parametric techniques provide a more powerful tool and approach than nonparametric statistics. The data and design parameters allowed the use of the t-test in this quasi-experiment. The t-test also enabled the researcher to evaluate differences between pairs of results in the time series design.

In addition, a nonparametric evaluation was performed utilizing the chi-square statistic which evaluated the relationship and differences between the groups (Witt, 1985), and was utilized as a validity check against the results that were obtained.

The statistical package that was used in this segment of the research was SPSS/PC+ STUDENTWARE PLUS (Norusis, 1991).

The SAS Program projected future productivity trends and two distinct statistical methods were used to accomplish that task. The first was the STEPAR method which first fits a time trend model to the series and takes the difference between each value and the estimated trend. Then, the remaining variation is fit using an auto regressive model. The second, is the EXPO method, which uses exponential smoothing to generate the forecast. This approach weights the most recent data more heavily than the early data points (SAS Institute, 1988).

Analysis and Results-Descriptive Data

Study Group Subjects

The study group consisted of 2125 subjects. The subjects were further broken into a control group of 250 subjects and a treatment group of 1875 subjects. The study group was further separated by gender and presented in Table I. This analysis displayed a male population of thirty eight percent and a female population of sixty two percent.

TABLE I

STUDY GROUP GENDER ANALYSIS

Group	Male	Female	Total
A	150	330	480
C	89	171	260
D	74	221	295
G	67	108	175
H	65	85	150
M	96	164	260
O	105	150	255
TOTAL TREAT	646	1229	1875
% of Total	34	66	100%
CONTROL GROUP	160	90	250
% of Total	64	36	100%
TOTAL STUDY GROUP	806	1319	2125
% of Total	38	62	100%

The study group was then split by age groupings for further analysis. The overall matrix is presented in Table II and portrays an aging workforce with seventy six percent of the study group age forty one and over.

TABLE II

STUDY PARTICIPANT AGE MATRIX

Group	>30	31-40	41-50	51+	Total
A	6	102	204	168	480
C	6	66	98	90	260
D	4	70	124	97	295
G	4	47	77	47	175
H		3	97	50	150
M	5	80	117	58	260
O	6	94	105	50	255
TOTAL TREAT	31	462	822	560	1875
% of Total	2	25	43	30	100%
CONTROL GROUP		5	117	128	250
% of Total	-	2	47	51	100%
TOTAL STUDY GROUP	31	467	939	688	2125
% of Total	2	22	44	32	100%

The study group was also evaluated on the basis of Equal Employment Opportunity/Affirmative Action (EEO/AA) governmental categories. This

analysis pointed out that the two main ethnic backgrounds, as expected, were white and black accounting for eighty seven percent of the subjects in the study group and asians contributed another ten percent. This data is presented in Table III.

TABLE III

ANALYSIS OF SUBJECTS BY AFFIRMATIVE ACTION CODE

TOTAL Group	White	Black	Asian	Indian	Hispanic	Total
A	274	143	46	7	10	480
C	145	76	35		4	260
D	158	101	27	5	4	295
G	95	46	27	1	6	175
H	120	29			1	150
M	141	63	46	2	8	260
O	160	48	35	8	4	255
TOTAL TREAT	1093	506	216	23	37	1875
% of Total	58	27	12	1	2	100%
CONTROL GROUP	216	27	1	3	3	250
% of Total	87	11	-	1	1	100%
TOTAL STUDY GROUP	1309	533	217	26	40	2125
% of Total	62	25	10	1	2	100%

Table IV analyzes the male subjects in the study group by affirmative action (AA) classification codes. It was observed that sixty six percent of the males in the study group were white and seventeen percent black. Asian males made up fourteen percent of the study group.

TABLE IV

ANALYSIS OF MALES BY AA CLASSIFICATION

Group	Grade	High	Bus	JC	SmCol	Col	Mst	Total
A	6	388	9	33	35	7	2	480
C	2	194	2	24	26	10	2	260
D		218	4	25	44	4		295
G	3	108	5	30	23	5	1	175
H		96		28	26			150
M	1	182	8	22	43	4		260
O		158	12	35	45	5		255
TOTAL	--	----	--	---	---	--	--	----
TREAT	12	1344	40	197	242	35	5	1875
% of Total	1	72	2	10	13	2	-	100%
CONTROL	--	---	--	--	--	--	--	----
GROUP		120		45	80	4	1	250
% of Total	-	48	-	18	32	2	-	100%
TOTAL	--	----	--	---	---	--	--	-----
STUDY GROUP	12	1464	40	242	322	39	6	2125
% of Total	1	69	2	11	15	2	-	100%

The same analysis was performed for the females in the study group population and yielded the following:

TABLE V

ANALYSIS OF FEMALES BY AA CLASSIFICATION

Group	White	Black	Asian	Indian	Hispanic	Total
A	192	103	26	6	3	330
C	92	59	18		2	171
D	117	82	13	5	4	221
G	63	33	9	1	2	108
H	58	26			1	85
M	83	49	26	1	5	164
O	102	26	14	6	2	150
TOTAL	---	---	---	--	--	----
TREAT	707	378	106	19	19	1229
% of Total	58	31	9	1	1	100%
CONTROL	--	--			--	----
GROUP	74	15			1	90
% of Total	82	17			1	100%
TOTAL STUDY	---	---	---	--	--	-----
GROUP	781	393	106	19	20	1319
% of Total	59	30	8	1	2	100%

The female population was distributed differently with white females making up fifty nine percent and black females thirty percent of the study group. Asian females were a distant third with eight percent of the population.

The final study group subject matrix evaluated the level of educational achievement. Table VI evaluated and displayed the levels of education achieved by the treatment groups and by the control group. Seventy percent of the study group had completed at least a high school program with another twenty eight percent having attended some college or business school. Further analysis was presented in the next table.

TABLE VI

LEVEL OF EDUCATIONAL ACHIEVEMENT BY STUDY GROUP

Group	Grade	High	Bus	JC	SmCol	Col	Mst	Total
A	6	388	9	33	35	7	2	480
C	2	194	2	24	26	10	2	260
D		218	4	25	44	4		295
G	3	108	5	30	23	5	1	175
H		96		28	26			150
M	1	182	8	22	43	4		260
O		158	12	35	45	5		255
TOTAL	--	----	--	---	---	--	--	----
TREAT	12	1344	40	197	242	35	5	1875
% of Total	1	72	2	10	13	2	-	100%
CONTROL	--	---	--	--	--	--	--	----
GROUP		120		45	80	4	1	250
% of Total	-	48	-	18	32	2	-	100%
TOTAL	--	----	--	---	---	--	--	-----
STUDY GROUP	12	1464	40	242	322	39	6	2125
% of Total	1	69	2	11	15	2	-	100%

Study Group Treatment Variables

This section graphically portrayed the variables that were evaluated in the study. The actual data points are presented in Appendix D. Figure I deals with the main thesis of the study, productivity. The figure displayed the data points for the control and treatment groups and the plot points were for the pre-test and two post-test periods, which was the case in all of the variables that were analyzed in this section.

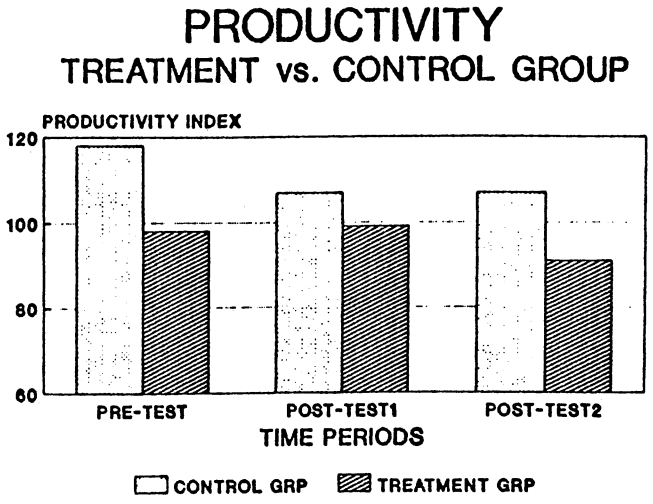


Figure 1

The productivity index decreased for the control group in the post-test 1 period and maintained in the post-test 2 period. The treatment group's productivity increased slightly and fell substantially in the second post treatment period.

The productivity index was further analyzed by removing treatment group A from the overall study due to the unique performance of that group, an "outlier" from all of the other study groups, including the control group. Further discussion will be presented on this phenomena in Chapter V. The resulting data is presented in Figure 2 below:

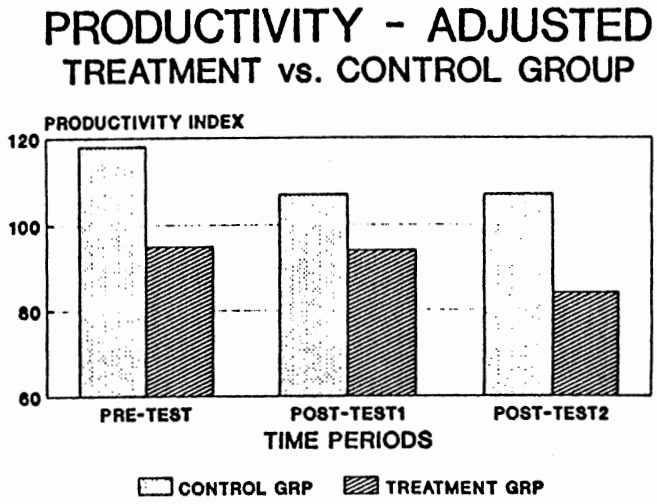


Figure 2

After treatment group A was removed from the overall treatment group data, the results were completely different. The adjusted treatment group's productivity decreased substantially over the two post-treatment periods.

Profitability was the second variable that was evaluated by this study. The data for this variable were presented in Figure 3 and a complete discussion of the results were analyzed in the hypothesis part of this chapter as well as in the final summary.

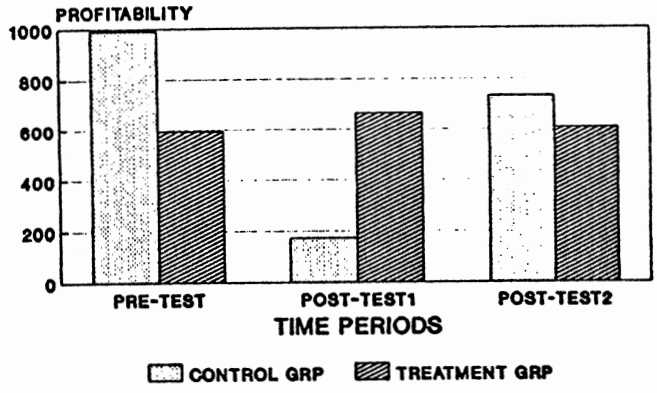


Figure 3

The control group did show a lot more volatility than the treatment group, yet, overall the mean results were comparable.

Figure 4 presents the work days lost metric which was of interest because like productivity, it was a variable that could be linked directly to the individuals in the work groups, both control and treatment.

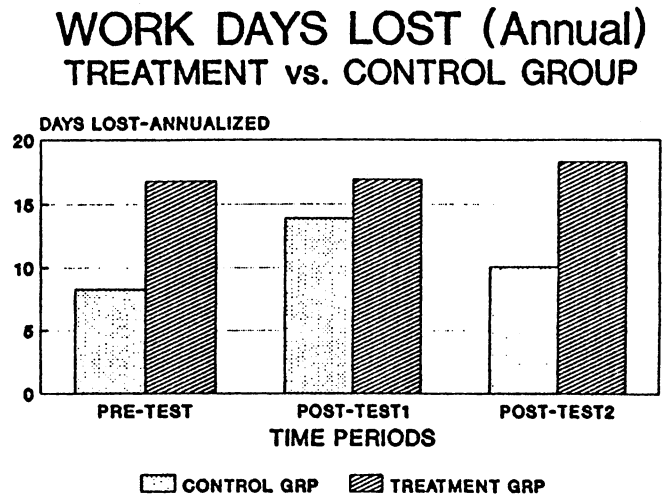


Figure 4

The work days lost statistic had different trend lines when comparing the control group to the treatment group.

Figure 5 compares supplies expense and Figure 6 compares total expense between the control and treatment groups portrayed over the study cycle.

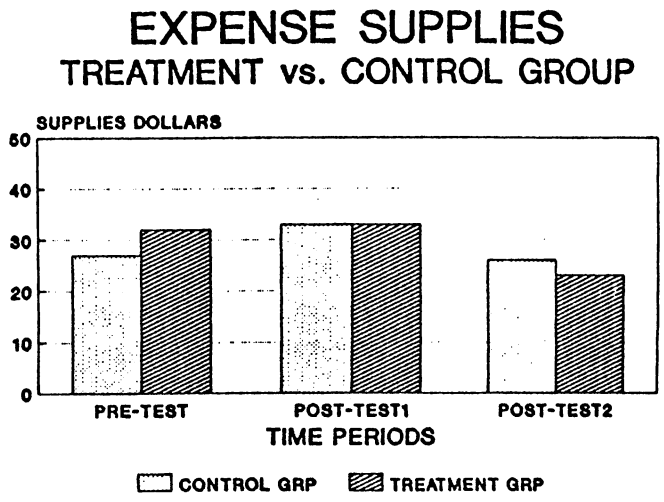


Figure 5

The total expense evaluation combines all of the incurred expenses into an overall graph and does have common properties included from the prior expense categories.

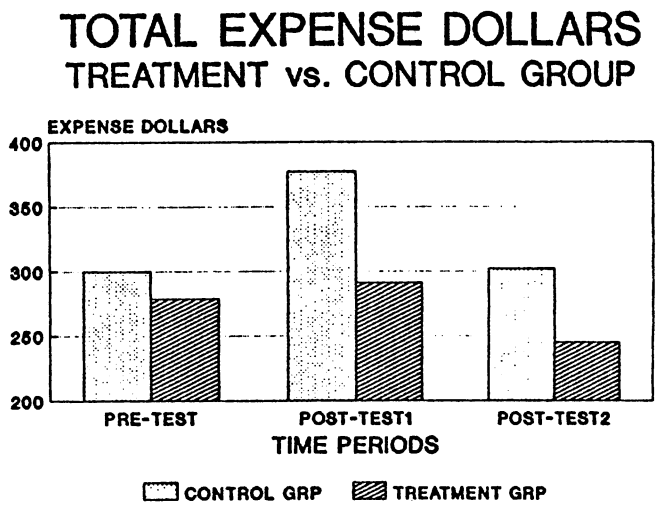
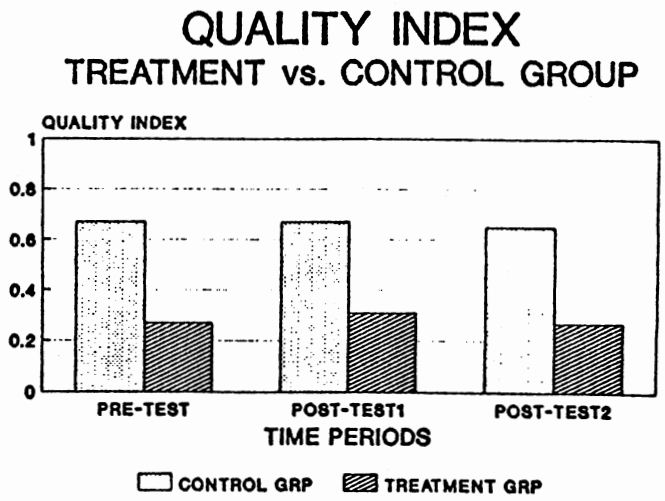


Figure 6

The trend was similar between the groups and an analysis was performed in the next section of this study as it pertains to total expenses.

The final variable that was evaluated by this study was the quality index and the differences over the study periods by the two groups. Figure 7 graphically presented the actual quality data that was recorded for the two study groups.



The quality performance of both groups, control and treatment, was much better than customer standard.

Hypothesis Tests-Productivity

The productivity variable was the major thrust of this study. Therefore, major emphasis was expended in evaluating this variable.

Analysis - The t-test.

The first analysis performed utilized the t-test and evaluated the actual results that were obtained by the control and treatment groups.

The resulting data was presented in Exhibit I and resulted in the rejection of the null hypothesis. As a reminder, the data points were all presented in Appendix D.

EXHIBIT I

T-TEST RESULTS-PRODUCTIVITY

HO: Diff = 0 vs ALT @ Alpha = 0.05

Computed t = 3.29794 Sig. Level = 0.0299913

So reject HO.

A multiple range analysis for productivity by group was also performed utilizing the Shaffe' at a ninety five percent confidence range, which also supported the conclusion that there was a difference.

When analyzing the individual groups that comprised the treatment group it was observed that group A's performance was substantially different than the rest of the treatment groups, and therefore, was considered to be an "outlier". The t-test was rerun excluding Group A. The results were comparable to the prior test.

EXHIBIT II

T-TEST RESULTS-PRODUCTIVITY MODIFIED

HO: Diff = 0 vs ALT @ Alpha = .05

Computed t = 3.87354 Sig. Level = 0.0179394

So reject HO.

Since productivity was the major variable of this study, and was the basis for the original experiment, it was believed that all potential biases should be removed from the data. Therefore, the productivity data was converted to a comparable starting base of 100 and the changes were calculated from that base, an approach that was considered to be more powerful in this type of an experiment (Witt, 1985). The conversion was also accomplished for the adjusted data that removed group A from the total treatment group's numbers. The t-test statistic was then run on the data, and the results are presented in Exhibit III.

EXHIBIT III

PRODUCTIVITY WITH DATA POINTS ADJUSTED TO 100

Data Points:

100 91 91 Computed t = -.89 Sig. level = .425

100 101 92 df = 4 No significance

EXHIBIT III (Cont.)

Data Points Adjusted:

100 91 91 Computed t = .000 Sig. level = 1.00

100 96 86 df = 4 No significance

This approach resulted in no difference between the groups. Therefore, the hypothesis was not rejected.

The last evaluation compared the productivity metrics between periods and groups. These data were evaluated at both the actual and adjusted basis.

EXHIBIT VI

PRODUCTIVITY BY PERIOD BY GROUP

PERIOD 1 AND 2

118 107 Computed t = 2.54 df = 2

98 99 Sig. level = .127 NO significance

PERIOD 2 AND 3

107 107 Computed t = 3.00 df = 2

99 91 Sig. level = .095 NO significance

EXHIBIT VI (Cont.)

PRODUCTIVITY BY PERIOD BY GROUP-ADJUSTED

PERIOD 1 AND 2

118	107	Computed t = 3.26	df = 2
95	94	Sig. level = .083	NO significance

PERIOD 2 AND 3

107	107	Computed t = 3.60	df = 2
94	84	Sig. level = .069	NO significance

The above exhibit portrayed the data points used in the evaluation that compared the control group to the treatment group and compared period one (pre-test) to period two (post-test1), and then period two (post-test1) to period three (post-test2).

This evaluation was also a more powerful approach than just the standard t-test since it evaluated change between groups and periods, and has also been called a correlated t-test (Witt, 1985). The evaluation did not result in a finding of significance.

Analysis - Chi-square

As a verification and back-up for the analysis performed earlier, the chi-square test was utilized. The initial analysis used the base data and the adjusted productivity data when group A was removed from the treatment results. The findings were shown in Exhibit 5. There was

a positive correlation between the groups and therefore, there was no major difference between the two groups.

EXHIBIT V

PRODUCTIVITY CHI-SQUARE ANALYSIS

			Value	df	Signif.
98	118	Pearson	.33457	2	.84596
99	107	Likelihood	.33439	2	.84604
91	107	Mantel-Haenszel	.01799	1	.89331

PRODUCTIVITY (ADJ) CHI-SQUARE ANALYSIS

95	118	Pearson	.34355	2	.84217
94	107	Likelihood	.34330	2	.84227
84	107	Mantel-Haenszel	.01151	1	.91458

The likelihood ratio tested for the independence between groups and productivity results and the Mantel-Haenszel for linear association.

The data was then adjusted to a base of 100 and the chi-square statistic was run for the base data and then again for the adjusted data which excluded Group A. The results again agreed with the null hypothesis that there was no significant difference between the treatment and control group. The results are presented below:

EXHIBIT VI

PRODUCTIVITY (BASE 100) CHI-SQUARE ANALYSIS

			Value	df	Signif.
100	100	Pearson	.31598	2	.85386
101	91	Likelihood	.31608	2	.85382
92	91	Mantel-Haenszel	.00459	1	.94601

PRODUCTIVITY (BASE 100-ADJ) CHI-SQUARE ANALYSIS

100	100	Pearson	.27493	2	.87156
96	91	Likelihood	.27495	2	.87156
86	91	Mantel-Haenszel	.06636	1	.79671

Hypothesis Tests-Results

The variable examined in this section pertained to the profitability comparison between the two groups.

Analysis - The t-test

The t-test results are presented in the next exhibit. There was not a significant difference between the groups and therefore, the null was not rejected. The multiple range analysis at a ninety five percent Scheffe' also backed up this recommendation.

EXHIBIT VII

T-TEST RESULTS-PROFITABILITY

HO: Diff = 0 vs ALT @ Alpha = 0.05

Computed t = 0.413149 Sig. Level = 0.969025

So do NOT reject HO.

A t-test was also run comparing changes from one period to the next by group. However, because there was no significance, no further discussion will take place in the body of this study.

Hypothesis Tests-Work Days Lost (Annualized)

This variable was one that the subjects had direct input to by their actions. It was a measure of behavior and therefore, one that could be impacted by treatment, if worker involvement does in fact increase performance.

Analysis - The t-test

The t-test compared the treatment group to the control group and the resulting metric recommended rejection of the null hypothesis. See Exhibit VIII for the actual t-test statistics.

EXHIBIT VIII

T-TEST RESULTS - WORK DAYS LOST

HO: Diff = 0 vs ALT @ Alpha = 0.05

Computed t = -3.81751 Sig. Level = 0.0188184

So reject HO.

The multiple range analysis at a ninety five percent confidence rate for the Scheffe' concurred with the above recommendation.

Analysis - Chi-square

The chi-square statistic was performed on the data and it substantiated the t-test result.

EXHIBIT IX

WORK DAYS LOST CHI-SQUARE ANALYSIS

			Value	df	Signif.
17	8	Pearson	.98861	2	.60999
17	14	Likelihood	.98399	2	.61140
18	10	Mantel-Haenszel	.02247	1	.88084

The data reflected that there was not a strong correlation between the groups for work days lost, therefore, the null hypothesis was suspect for this variable.

Hypothesis Tests-Expense Supplies

This variable was one that could be somewhat impacted by employee involvement systems and therefore, an analysis was performed on the actual performance of the control and treatment groups.

Analysis - The t-test

The t-test statistic was run comparing the control group to the treatment group. The results indicated a recommendation to not reject the null hypothesis at a ninety five percent confidence interval.

EXHIBIT X

T-TEST RESULTS - EXPENSE SUPPLIES

HO: Diff = 0 vs ALT @ Alpha = 0.05

Computed t = -0.172774 Sig. Level = 0.871219

So DO NOT reject HO.

Analysis - Chi-square

The chi-square analysis did not provide a strong back-up to the null hypothesis in this case as portrayed by the results listed below in Exhibit XI.

EXHIBIT XI

EXPENSE SUPPLIES CHI-SQUARE ANALYSIS

			Value	df	Signif.
32	27	Pearson	.58449	2	.74659
33	33	Likelihood	.58504	2	.74638
23	26	Mantel-Haenszel	.57552	1	.44808

Hypothesis Tests-Total Expense

This variable consisted of total expense dollars expended to support required production. While the employee involvement teams could not impact totally on this metric, this researcher believed that the treatment group could have some impact on the overall results.

Analysis - The t-test

The data was analyzed utilizing this statistic and it resulted in a recommendation to not reject the null hypothesis.

EXHIBIT XII

T-TEST RESULTS - TOTAL EXPENSE

HO: Diff = 0 vs ALT @ Alpha = 0.05

Computed t = 1.89535 Sig. Level = 0.130939

So DO NOT reject HO.

Analysis - Chi-square

The chi-square statistic did not show strong correlation between the two groups as evidenced by the data generated by this statistic.

EXHIBIT XIII

TOTAL EXPENSE CHI-SQUARE ANALYSIS

			Value	df	Signif.
279	300	Pearson	2.80442	2	.24605
291	377	Likelihood	2.80177	2	.24638
245	302	Mantel-Haenszel	1.35690	1	.24408

Hypothesis Tests-Quality

The last variable that was evaluated was quality performance. This variable can be directly impacted by employee involvement initiatives.

Analysis - The t-test

The t-test analysis resulted in a recommendation to reject the null hypothesis. However, this significance could have been the result of the base starting points being so diverse. The data was adjusted to a base of 100 and the t-test was rerun from a common starting point. The results are presented in Exhibit XIV.

EXHIBIT XIV

T-TEST RESULTS - QUALITY

ACTUAL DATA:

HO: Diff = 0 vs ALT @ Alpha = 0.05

Computed t = 25.4912 Sig. Level = 1.4065E-5

So reject HO.

DATA ADJUSTED TO BASE OF 100:

HO: Diff = 0 vs ALT @ Alpha = 0.05

Computed t = -1.18 Sig. Level = .305

So DO NOT reject HO.

Analysis - Chi-square

The analysis that was performed substantiated the null hypothesis that there was not a major difference between the treatment and control groups for this variable.

EXHIBIT XV

QUALITY CHI-SQUARE ANALYSIS

.27	.67	Pearson	.21559	2	.89781
.31	.67	Likelihood	.21473	2	.89820
.27	.65	Mantel-Haenszel	.00915	1	.92378

As this statistic pointed out, there was a strong correlation between the treatment and control group and validated the above findings.

Productivity Projections

The SAS program was used to forecast future periods for both the treatment and control groups (SAS Institute, 1988). The two techniques, exponential smoothing and autoregression, both did not show any trend, rather they projected a relatively flat line in the future. Figure 8 graphically depicts the forecast using these methods and Table VII presents the same data in a numerical format.

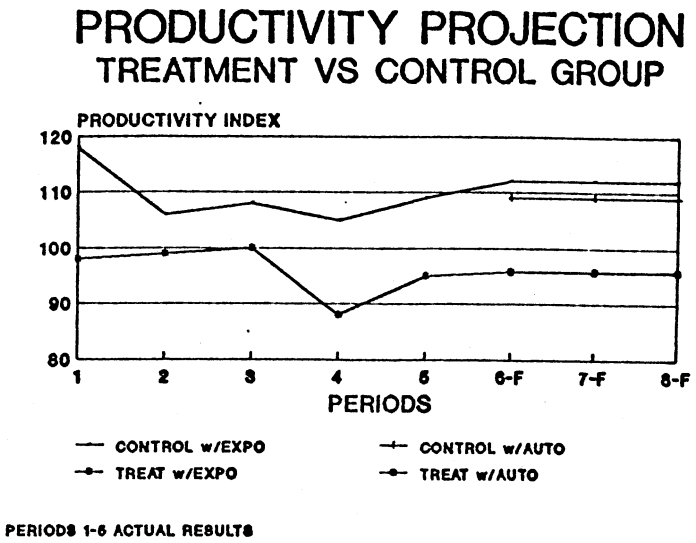


Figure 8

TABLE VII

PRODUCTIVITY INDEX PROJECTION

PERIOD	CONTROL GROUP ACTUAL	CONTROL GROUP FORECAST EXPO	CONTROL GROUP FORECAST AUTO	TREATMENT GROUP ACTUAL	TREATMENT GROUP FORECAST EXPO	TREATMENT GROUP FORECAST AUTO
1	118			98		
2	106			99		
3	108			100		
4	105			88		
5	109			95		
6		111.8	109.4		95.8	95.7
7		111.8	109.4		95.8	95.7
8		111.8	109.4		95.8	95.7

EXPO utilizes single exponential smoothing technique
AUTO utilizes the stepwise autoregressive technique
Data forecasted using the SAS program

A least squares regression line was also calculated. The results of that calculation resulted in a very slight difference in the slope of the line when projected into future periods. The least squares calculation resulted in the following negative trend projection:

EXHIBIT XVI

LEAST SQUARES TREND LINE

CONTROL GROUP: $Y = 114.9 - 1.9x$

TREATMENT GROUP: $Y = 101.1 - 1.7x$

Summary

This chapter included a description of the statistical methods employed, analysis of the resulting data for the six study variables, and a forecast of the productivity variable into future periods.

There was significant differences between the groups on three of the study variables on the initial t-test analysis. However, after further analysis and investigation, it was determined that only work days lost resulted in a significant difference between groups. An indepth discussion of the study findings will be conducted in the next chapter.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS

The purpose of this study was to compare the levels of performance of employee involvement teams to those of traditionally supervised employees doing the same work. This chapter presents the summary, conclusions, recommendations for practice, recommendations for further research, and the implications of the study.

Summary

Many successful large companies were not generally implementing participative management methods. Grazier (1989) believed that since these companies were doing relatively well and that since the standard of living was acceptable, there was no motivation or need to change.

The current management literature was replete with unsubstantiated claims that participative management and employee involvement were the keys to increasing productivity (Baloff & Doherty, 1990), (Dulworth et al., 1990), (Penzer, 1991), and (Saporito, 1986).

There were other experts who believed just the opposite, and actually stated that employee involvement systems had no or a perverse effect on productivity and performance (Harrison, 1991), (Marrow, 1975), (Miller, 1991), and (Stanton, 1983).

The problem which gave rise to this study was the inadequacy of research which established that employee involvement systems contributed to increased productivity or performance. The literature search also pointed out the need for more empirical evidence.

The study compared the performance of two groups, one which followed employee involvement practices and the other traditional management practices, against six variables in a pretest post-test quasi-experimental design. The study was conducted in a large manufacturing entity, over a two and a half year period, in a field environment, and involved 2125 subjects. The study utilized a t-test and chi-square analysis.

It was expected that productivity in employee involvement plants would be thirty to forty percent higher than in traditionally managed ones (Garwood, 1990). By this metric, the treatment group failed to perform.

It was expected that employee involvement practices would increase productivity, motivation, and job satisfaction, and decrease absenteeism (Baloff & Doherty, 1990) and (Dulworth et al., 1990).

There was no significant difference between levels of performance of employee involvement teams and traditionally supervised ones. In the final analysis, there was only one variable of six that showed a significant difference between groups. That variable was work days lost, and there the difference was negatively correlated, i.e., the control group performed better than the treatment group, contrary to expectations espoused by the experts.

However, Group H displayed even greater improvement than the control group and exhibited a tendency toward fewer days lost than the balance of the study groups. The population of Group H consisted of 9% more males than the overall treatment population, 98% of their population was over 41 as opposed to 73% for the treatment group, and 80% were of Caucasian background versus 58% for the balance of the treatment group. In addition, 36% of group H achieved some college or junior college experience versus 25% for the treatment group.

Group H was comparable to the Control Group in age, had 21% fewer males, was 7% less Caucasian, and had 16% less college or junior college experience than the Control Group. These demographics were in direct contrast to the treatment population and therefore, no conclusions could be made without further study.

The initial t-test evaluation that was performed on the productivity index resulted in a finding of a significant difference between the control and treatment group ($t= 3.298$, $p<.05$). However, as discussed in Chapter IV, further evaluation resulted in no significant difference between the groups when the data were evaluated on a common base. Furthermore, when projecting the productivity of the control and treatment groups into future periods, there was no significant difference in performance between the treatment and control groups.

Group A performed in direct contrast to the control and treatment groups on the productivity index. Group A was the largest of the entities making up the treatment group. However, the population of the

group closely mirrored the total treatment group, other than in educational achievement, where Group A had 10% fewer subjects who attended classes beyond high school.

The leader of group A is the top rated manager at the study location. This fact combined with sound employee involvement practices could account for the superior performance of Group A.

The quality index evaluation resulted in a recommendation to reject the null hypothesis. However, when the researcher adjusted the study variable to a common base of 100, there was no significant difference between the groups.

The other three variables that were evaluated: results, expense supplies, and total expenses, all resulted in no significant differences between the control and treatment groups and therefore, the null hypothesis was not rejected.

Conclusions

Based upon the findings, there was no difference between the productivity and performance of employee involvement groups and traditionally managed organizations. Perhaps the real difference in performance was caused by the management practices of the group leaders, as indicated by the study results of Group A.

It should be recognized that the findings could be affected by the length of the study period not being at least five to ten years in duration. If the study continued, perhaps the performance of the

employee involvement teams would end up to be different from the traditionally managed teams.

The trainers and facilitators were top performers, but were not evaluated during the study and could have contributed negatively to the performance of the employee involvement teams.

The control group consisted of employees that were not well respected by their peers or management. They were "mavericks" and worked in an "end of the line" operation where they could control the fate of the total organization. The researcher considered it significant that the employee involvement teams did not perform better than the control group, a group that clearly relished its role of being powerful and troublesome.

The study results do not contradict prior studies as discussed in the literature search. However, there are other studies that have reached the opposite conclusion.

Employee involvement teams have made a difference in prior studies, and intuitively should contribute to increased performance in the long term. However, in the final analysis, employee involvement teams did not perform better than the traditionally managed ones in the study. The role of the existing culture at the organization could have contributed to this lack of increased performance as well as the length of the study.

Recommendations for Practice

The organization should continue to implement employee involvement practices because experts believe that successful implementation requires five to ten years (Dumaine, 1990a), (Hannah, 1990), and (Collitti, 1986) and as long as the process was not counter-productive it should be continued.

The initial approach by this organization was to gain employee trust and participation. The next step should be to increase the employee's responsibilities and to give the employee involvement groups more autonomy for decision making and self regulation.

Management participation appeared to be adequate. However, it is recommended that additional training be provided, and mandated if necessary, to further the employee involvement process and to help managers in the transition from cop to leader.

Recommendations for Further Research

The study should be continued into future periods to evaluate whether increased experience and time with employee involvement systems do in fact enhance productivity.

The study should also evaluate the effects individual leaders, both managers and facilitators, have on performance.

Group A's productivity performance should be evaluated to determine what variables caused their performance to be superior to all other groups in this study.

Group H's superior performance on decreased absenteeism needs to be understood and emulated for future application.

Implications

Managers of tomorrow must be able to get people to commit themselves to the business in order for the business to be successful (Dumaine, 1989). Work teams have been a positive way of fostering employee involvement and possibly commitment (Schonberger, 1982).

The study did not find any correlation between employee involvement practices and increased employee productivity and performance.

The only desirable correlation appears to be between the study variables and good management/leaders.

Perhaps if this organization had been smaller and could have hired employees that did not have prior cultural expectations, the study results could have been different. This approach would have resulted in subjects having no prior built in biases and hiring could have been based on team compatability, a required skill set, and educational requirements.

In addition, the union environment and the rigid rules associated with the labor contract could have effected the outcome of the study. The employee involvement teams were not allowed to address items covered in the union contract such as work rules and peer subject's lack of performance.

The short length of time over which the study was conducted, two and one half years, could have contributed to the non difference between the treatment and control groups.

The study results indicate that employee involvement team performance was not different from traditionally supervised employees performing the same type of work. In fact, there were some indications that productivity might be better where top managers are leading the organizations, regardless of whether the groups utilize employee involvement practices or the more traditional approaches.

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APPENDIXES

APPENDIX A

HISTORY OF THE MANUFACTURING PROCESS AND SYSTEM

In 1798, fearing a war with France, the United States awarded a contract to Eli Whitney to produce 10,000 muskets rapidly. Production of muskets through gunsmiths was a slow process because each musket was produced one at a time. Eli came up with an assembly line approach where each employee built one part to specification and passed it on. This was the first process that utilized standardized and interchangeable parts. Eli Whitney is considered the father of the "System of Mass Production" in this country (Grazier, 1990).

This system had obvious benefits. According to Grazier (1990), it brought dramatically increased methods of production, resulting in lower more affordable prices. But, there was a negative effect that was overshadowed by the benefits, and has gone virtually unnoticed until this century. As opposed to the worker/gunsmith having a challenging task of producing the entire musket, he now had a much smaller task which was repeated over and over again--a task that required little thinking. In effect, Grazier stated, this approach had begun to draw the worker away from the thinking process of his job.

About 100 years later, Grazier reported, that Henry Ford carried the process one step further with the concept of the moving assembly line. Frederick Taylor refined this process more and actually began to define the roles of management and labor. Taylor was occupied with concepts that would increase production in manufacturing. He dealt with the concept of time studies and organizing and streamlining the production flow. His principles of "scientific management" became widely accepted. Management was quick to adopt these remedies because relationships with

labor were generally poor in the late 1800's. Taylor's scientific approach permitted them to deal with the work flow procedures and equipment improvements rather than the more complex issues of employee commitment and morale. Taylor believed that the "experts" solved problems in organizations and that management was the "thinker" and labor's role was one of "doer." Although this approach is patently archaic in today's society, most of the work in the United States is still performed using this philosophy (Grazier, 1990).

APPENDIX B

CORPORATE EMPLOYEE INVOLVEMENT RESULTS

Steelcase

If the company had continued doing business the way they had always done--even though that had gotten them where they are today--it might not be enough to compete in the future. Steelcase's management believed that they had to start involving the people more and fully utilize their people's talents. The five principles of Steelcase's program are: Quality, faster throughput, elimination of waste, a product-group focus (or focused factories), and employee involvement. Nearly 90% of the firm's 5,400 Grand Rapids-area employees have been organized into 560 teams. The teams receive eight hours of training in world class manufacturing (WCM) concepts, as well as training in the seven principles of problem solving. They made work-team participation mandatory at the factory. Customer lead-times were reduced from 12 weeks to six. Increase in work-in-process turns from 22 a year to 35, despite a 73% increase in the number of parts used. Manufacturing cycle reduced to an average of five days--compared with 25 to 30 in a traditional plant. Total savings were $1.2 million in a little over a year (Sheridan, 1990).

The Wizards of Buick City

It took five years before Buick City could brag about its world-class quality levels, an achievement that came in the midst of an incredible amount of change: four different plant managers, a change in the UAW plant leadership, introduction of massive doses of technology, introduction of a whole new manufacturing process (including Just-In-Time manufacturing) and introduction of a pay-for-knowledge system that

replaced the senority system. Instead of hundreds of job classifications, the plant now has three; finally, the introduction of the team approach and use of participative management, instead of the dictatorial approach. There are no bosses at Buick City, only counterparts. There is one parking lot for all employees, and other barriers are tossed out as they are discovered. The results speak for themselves. Since Buick City began production in 1985, its problems per hundred cars have decreased by 44%. Warranty costs have been reduced 59% for the first 30 days of ownership between 1986 and 1989. Discrepencies per car in the first 30 days has dropped by 77% since the 1986 model year. Assembly hours per car have dropped 23% since 1985. Absenteeism down to less than 2%--a 40% improvement (Moskal, 1990). (It should be noted that this was a new plant/facility.)

Citizens Gas and Coke Utility

A 103-year-old firm, located in Indianapolis, has improved its operations over the last four years with a total quality effort built upon employee teams addressing important issues confronting the company and focusing on a customer satisfaction process (Lindemann, 1990).

Payback: a new suggestion system has generated more usable suggestions in a-year-and-a-half than the old system in 35 years. Since 1986, grievances are down 63%, arbitrations are down 45%, and labor related legal costs are 40% down. Overall customer favorability ratings have progressed from 65% in 1987 to 71%, and 76% in '88 and '89. Quality audits have risen from a low of 52% in 1987, to above 85% in 1989 and

1990. Lost time injuries in the manufacturing division have decreased from 8.6 in 1985, to 2.6 in 1989 per 200,000 hours. The secret of success with teams is due to five factors: 1.) Team building is not an end to itself, 2.) management leads by example, 3.) teams which deal with issues need to be chartered and advised, 4.) team performance improves if the team is allowed to have fun through means such as coming up with original names, slogans, skits, etc., and 5.) recognition of team performance is crucial (Lindemann, 1990).

ORYX Energy Company

Oryx Energy Company of Dallas, an independent oil and gas producer that has total assets of over $4 billion and proven oil reserves of 1 billion barrels, has established a unique approach to the relationships between worker and bosses. It has gone from an operation swamped in paperwork and procedures into a dynamic elite organization that utilizes "natural work teams." The teams unearthed problems, brainstormed them, and developed solutions (Rohan, 1990).

After two years the results are starting to show: the quantifiable ones come to about $75 million a year. The largest chunk (about $45 million) is in payroll, because there are now fewer layers of management and nearly 1000 fewer employees. Another $15 million is being saved through better field operation, and $15 million more is being realized through better management of contractor services at the well sites (Rohan, 1990).

Eastman Kodak Company

Eastman has discovered a novel way to turn an ailing manufacturing operation around: Put the hourly workers in charge. Ralph Olney, a Kodak Division manager did just that in "Room 13," a Kodak operation that manufactures professional film. Olney eliminated the five levels of management between himself and the floor personnel. He gave the hourly employees the power to make purchasing decisions, start and stop the assembly lines, and design equipment to meet their needs, not management's. The improved operating results were evident immediatelly. In 1988, Room 13 ran about $1 million over its $30 million budget. In 1989, with the workers in charge, the unit came in $1.5 million under budget, and so far this year, they are running $600,000 below target. The percent of finished goods with zero defects jumped from 75% to 99%. "We must improve quality and you can't do that without empowering your people," says Kay Whitmore, Kodak CEO. "You have to get rid of the managerial infrastructure that historically was put in to control people (Hillkirk, 1990a, p. 48)." Whitmore stated that about 10% of Kodak Divisions are heavily involved in this approach with another 30-40% starting to mimic it. Not all want to work in this type of environment and have opted for reassignment (Hillkirk, 1990a).

Kodak's changes have posted roller-coaster financial results and the jury is still deliberating whether the restructuring and resizing have had the desired effect on bottom line results per a current Wall Street Journal article (Rigdon, 1992).

Dana Corporation

Two strategies were paramount: A streamlined JIT system built around manufacturing cells, and a heavy reliance on a team structure. The teams are primarily self-directed. They elect their own team captains and tackle various continuous-improvement projects-- including set-up reduction, preventative maintenance, and adopting KANBAN systems. It took about a year for the team training to have a real bottom-line impact. Results became evident after approximately 50% to 60% of the people were trained. But the training did pay at least one early dividend--workers began contributing ideas to improve the original work-cell design (Sheridan, 1990).

In the last three years, the 330-employee plant, which makes hydraulic control valves, has reduced manufacturing through-put time 92%, increased productivity 32%, trimmed customer leadtime from 6 months to 6 weeks, consolidated two plants into one-- producing comparable output in half the manufacturing space, boosted on-time delivery to the 95% range, pared quality costs by 47%, trimmed total inventory 50%, and improved return on investment 470%, and return on sales of 320% (Sheridan, 1990).

Toledo Scale

The emphasis these days is on self-managed work teams and a "pay-for-skills" program that encorages cross training (Sheridan, 1990).

To get the required effect and benefit from work cells throughout the factory; flexibility through cross training, and a willingness to learn new skills are mandatory. This approach has included the following

payoffs: there were dramatic reductions in throughput time. For example, two weeks to three days for the (PCB) Printed Circuit Board area, a reduction of 67% in the (WIP) work in process inventory, an 85% drop in defect rates in the PCB line, on-time delivery in the 99% range, and a 24% increase in productivity in the first two years based on value of shipments per employee (Sheridan, 1990).

Westinghouse Commercial Nuclear Fuels Division

This winner of the first National Malcom Baldrige Quality Award, believes that total quality is a way of doing business--an all encompassing strategy for creating value for customers, stockholders, employees and community. Total quality recognizes that excellence requires a commitment to continuous quality improvement in every facet of running the business. A total quality culture requires excellent, highly trained and motivated people who take pride in their work, who are committed to continuous improvement, and who embrace new ideas. Participation through quality improvement teams is the cornerstone of human resource excellence (Commercial Nuclear Fuels Division-Westinghouse [CNFD-W], 1989). Major accomplishments were: A significant improvement in product reliablility --from 99.95% to 99.995%--in three years and rapidly approaching 99.9995%; 100% on-time shipments since 1985; improvement in once-through yield rates for fuel tubing of over 16 percentage points in four years; continuous increase in on-time and error-free software from 90% to over 98% in three years; a 30% reduction in total quality costs as a percent of sales in four years due to reduced

rework and scrap costs; and winning the Malcom Baldrige National Quality Award. Westinghouse took initiatives in 3 areas: training, participation and motivation (CNFD-W, 1989). "The team approach was the key to success, not good management" (Utlag, 1990).

Others

Ten years ago there were practically no superteams. Only a handful of companies--Proctor & Gamble, Digital Equipment, and TRW, to name a few--were experimenting with them. But a recent survey of 476 FORTUNE 1,000 companies, published by the American Productivity & Quality Center in Houston, shows that while only 7% of the work force is organized in self-managed teams, half the companies questioned say that they will be relying significantly more on them in the years ahead. Those who have taken the plunge have seen impressive results:

* The General Mills plant in Lodi, California runs with no second shift supervision.

* A team of Federal Express employees spotted and solved a billing problem that was costing the company $2.1 million a year.

* 3M cross functional teams tripled the number of new products.

* Aetna Life and Casualty reduced the ratio of middle managers to workers from one to seven down to one to thirty--all while improving customer service.

* Teams at Johnsonville Sausage have increased production by 50% since 1986 which helped the CEO make the decision to have a major expansion (Dumaine, 1990b).

APPENDIX C

STUDY POPULATION DESCRIPTION

GROUP	1990	ON ROLL 1992	AVE	DESCRIPTION/COMMENTS
A	538	421	480	TREATMENT GROUP - Store, Assembly
B	35	10	20	EXCLUDED - Being Discontinued
C	254	268	260	TREATMENT GROUP - Assembly oper.
D	253	336	295	TREATMENT GROUP - Assembly oper.
E	220	201	210	EXCLUDED - Machine controlled oper.
F	200	196	200	EXCLUDED - Had not rec'd treatment.
G	187	159	175	TREATMENT GROUP - Assembly oper.
H	168	132	150	TREATMENT GROUP - Testing operation
I	124	107	115	EXCLUDED - Had not rec'd treatment
J	57	59	55	EXCLUDED - Being discontinued
K	225	182	200	EXCLUDED - Repair oper. Not rated
L	110	83	95	EXCLUDED - Had not rec'd treatment
M	242	275	260	TREATMENT GROUP - Assembly oper.
N	266	238	250	CONTROL GROUP - Testing operation
O	298	212	255	TREATMENT GROUP - Assembly oper.
P	310	157	230	EXCLUDED - Product consolidation
16	3487	3036	3250	TOTAL POPULATION
5	812	599	715	EXCLUDED - Machine controlled, discontinued, repair-not rated, being consolidated.
11	2675	2437	2535	VALID POPULATION FOR STUDY
3	434	386	410	EXCLUDED-Had not rec'd treatment
8	2241	2051	2125	STUDY PARTICIPANTS
73%	84%	84%	84%	PARTICIPANTS/VALID POPULATION

* 100% of the groups that received TREATMENT are participating in this study.

APPENDIX D

STUDY DATA POINTS

GROUP	PERIOD	PRODUCTIVITY ORIG	PRODUCTIVITY ADJ	RESULTS	WORK DAYS LOST (ANN)
CONTROL	PRE	118	118	990	8.3
	POST1	107	107	174	13.9
	POST2	107	107	735	10.1
TREATMENT	PRE	98	95	595	16.8
	POST1	99	94	667	16.9
	POST2	91	84	607	18.3

GROUP	PERIOD	EXPENSE SUPPLIES	CONF COSTS	TOTAL EXPENSE	QUALITY INDEX
CONTROL	PRE	27	186	300	.67
	POST1	33	237	377	.67
	POST2	26	148	302	.65
TREATMENT	PRE	32	64	279	.27
	POST1	33	75	291	.31
	POST2	23	54	245	.27

The treatment group is a weighted average of the seven treatment groups.

APPENDIX E

STATISTICAL TEST RESULTS

PRODUCTIVITY ANALYSIS

		118 107 107	98 99 91	Pooled
Sample Statistics:	Number of Obs.	3	3	6
	Average	110.667	96	103.333
	Variance	40.3333	19	29.6667
	Std. Deviation	6.35085	4.3589	5.44671
	Median	107	98	103

Difference between Means = 14.6667

Conf. Interval For Diff. in Means:		95 Percent	
(Equal Vars.)	Sample 1 - Sample 2	2.31482 27.0185	4 D.F.
(Unequal Vars.)	Sample 1 - Sample 2	1.6634 27.6699	3.5 D.F.

Ratio of Variances = 2.12281

Conf. Interval for Ratio of Variances:	0 Percent
Sample 1 - Sample 2	

Hypothesis Test for H0: Diff = 0	Computed t statistic = 3.29794
vs Alt: NE	Sig. Level = 0.0299913
at Alpha = 0.05	so reject H0.

Multiple range analysis for prodty by group

Method: 95 Percent Scheffe

Level	Count	Average	Homogeneous Groups
2	3	96.00000	*
1	3	110.66667	*

		118 107 107	95 94 84	Pooled
Sample Statistics:	Number of Obs.	3	3	6
	Average	110.667	91	100.833
	Variance	40.3333	37	38.6667
	Std. Deviation	6.35085	6.08276	6.21825
	Median	107	94	101

Difference between Means = 19.6667

Conf. Interval For Diff. in Means:		95 Percent	
(Equal Vars.)	Sample 1 - Sample 2	5.56515 33.7682	4 D.F.
(Unequal Vars.)	Sample 1 - Sample 2	5.55481 33.7785	4.0 D.F.

Ratio of Variances = 1.09009

Conf. Interval for Ratio of Variances:	0 Percent
Sample 1 - Sample 2	

Hypothesis Test for H0: Diff = 0	Computed t statistic = 3.87354
vs Alt: NE	Sig. Level = 0.0179394
at Alpha = 0.05	so reject H0.

Two-Sample Analysis Results

		100 91 91	100 101 92	Pooled
Sample Statistics:	Number of Obs.	3	3	6
	Average	94	97.6667	95.8333
	Variance	27	24.3333	25.6667
	Std. Deviation	5.19615	4.93288	5.06623
	Median	91	100	96

Difference between Means = -3.66667

Conf. Interval For Diff. in Means:		95 Percent	
(Equal Vars.)	Sample 1 - Sample 2	-15.1557 7.82233	4 D.F.
(Unequal Vars.)	Sample 1 - Sample 2	-15.1679 7.83458	4.0 D.F.

Ratio of Variances = 1.10959

Conf. Interval for Ratio of Variances: 0 Percent
Sample 1 - Sample 2

Hypothesis Test for H0: Diff = 0 vs Alt: NE at Alpha = 0.05
Computed t statistic = -0.886405
Sig. Level = 0.425477
so do not reject H0.

Two-Sample Analysis Results

		100 91 91	100 96 86	Pooled
Sample Statistics:	Number of Obs.	3	3	6
	Average	94	94	94
	Variance	27	52	39.5
	Std. Deviation	5.19615	7.2111	6.2849
	Median	91	96	93.5

Difference between Means = 0

Conf. Interval For Diff. in Means:		95 Percent	
(Equal Vars.)	Sample 1 - Sample 2	-14.2527 14.2527	4 D.F.
(Unequal Vars.)	Sample 1 - Sample 2	-14.8284 14.8284	3.6 D.F.

Ratio of Variances = 0.519231

Conf. Interval for Ratio of Variances: 0 Percent
Sample 1 - Sample 2

Hypothesis Test for H0: Diff = 0 vs Alt: NE at Alpha = 0.05
Computed t statistic = 0
Sig. Level = 1
so do not reject H0.

SPSS/PC+ Studentware+

t-tests for independent samples of GROUP Group

Variable	Number of Cases	Mean	SD	SE of Mean
PRODCTIV Productivity Metric				
Control Groups	2	11.2500	.778	.550
Treatment Groups	2	9.8500	.071	.050

Mean Difference = 1.4000

Levene's Test for Equality of Variances: F=7.2E+18 P= .000

	t-test for Equality of Means				95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	2.54	2	.127	.552	(-.976, 3.776)
Unequal	2.54	1.02	.236	.552	(-5.617, 8.417)

SPSS/PC+ Studentware+

t-tests for independent samples of GROUP Group

Variable	Number of Cases	Mean	SD	SE of Mean
PRODCTIV Productivity Metric				
Control Groups	2	10.7000	.000	.000
Treatment Groups	2	9.5000	.566	.400

Mean Difference = 1.2000

Levene's Test for Equality of Variances: F= . P= .

	t-test for Equality of Means				95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	3.00	2	.095	.400	(-.521, 2.921)
Unequal	3.00	1.00	.205	.400	(-3.882, 6.282)

SPSS/PC+ Studentware+
t-tests for independent samples of GROUP Group

Variable	Number of Cases	Mean	SD	SE of Mean
PRODCTIV Productivity Metric				
Control Groups	2	11.2500	.778	.550
Treatment Groups	2	9.4500	.071	.050

Mean Difference = 1.8000

Levene's Test for Equality of Variances: F=7.2E+18 P= .000

t-test for Equality of Means Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	3.26	2	.083	.552	(-.576, 4.176)
Unequal	3.26	1.02	.186	.552	(-5.217, 8.817)

SPSS/PC+ Studentware+
t-tests for independent samples of GROUP Group

Variable	Number of Cases	Mean	SD	SE of Mean
PRODCTIV Productivity Metric				
Control Groups	2	10.7000	.000	.000
Treatment Groups	2	8.9000	.707	.500

Mean Difference = 1.8000

Levene's Test for Equality of Variances: F= . P= .

t-test for Equality of Means Variances	t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	3.60	2	.069	.500	(-.351, 3.951)
Unequal	3.60	1.00	.172	.500	(-4.553, 8.153)

SPSS/PC+ Studentware+

PERIOD Page 1 of 1

GROUP	Count / Exp Val / Residual	PRE 1.00	POST1 2.00	POST2 3.00	Row Total
.00		95 96.1 -1.1	94 90.7 3.3	84 86.2 -2.2	273 45.1%
1.00		118 116.9 1.1	107 110.3 -3.3	107 104.8 2.2	332 54.9%
Column Total		213 35.2%	201 33.2%	191 31.6%	605 100.0%

Chi-Square	Value	DF	Significance
Pearson	.34355	2	.84217
Likelihood Ratio	.34330	2	.84227
Mantel-Haenszel test for linear association	.01151	1	.91458

Minimum Expected Frequency - 86.187

PERIOD Page 1 of 1

GROUP	Count / Exp Val / Residual	PRE 1.00	POST1 2.00	POST2 3.00	Row Total
.00		100 101.9 -1.9	101 97.8 3.2	92 93.3 -1.3	293 51.0%
1.00		100 98.1 1.9	91 94.2 -3.2	91 89.7 1.3	282 49.0%
Column Total		200 34.8%	192 33.4%	183 31.8%	575 100.0%

Chi-Square	Value	DF	Significance
Pearson	.31598	2	.85386
Likelihood Ratio	.31608	2	.85382
Mantel-Haenszel test for linear association	.00459	1	.94601

Minimum Expected Frequency - 89.750

SPSS/PC+ Studentware+

GROUP	Count / Exp Val / Residual	PERIOD PRE 1.00	POST1 2.00	POST2 3.00	Row Total
.00		100	96	86	282
		100.0	93.5	88.5	50.0%
		.0	2.5	-2.5	
1.00		100	91	91	282
		100.0	93.5	88.5	50.0%
		.0	-2.5	2.5	
Column Total		200 35.5%	187 33.2%	177 31.4%	564 100.0%

Chi-Square	Value	DF	Significance
Pearson	.27493	2	.87156
Likelihood Ratio	.27495	2	.87156
Mantel-Haenszel test for linear association	.06636	1	.79671

Minimum Expected Frequency - 88.500

PROFITABILITY

Two-Sample Analysis Results

		990 174 735	595 667 607	Pooled
Sample Statistics:	Number of Obs.	3	3	6
	Average	633	623	628
	Variance	174267	1488	87877.5
	Std. Deviation	417.453	38.5746	296.441
	Median	735	607	637

Difference between Means = 10

Conf. Interval For Diff. in Means:		95 Percent		
(Equal Vars.)	Sample 1 - Sample 2	-662.258	682.258	4 D.F.
(Unequal Vars.)	Sample 1 - Sample 2	-1015.19	1035.19	2.0 D.F.

Ratio of Variances = 117.115

Conf. Interval for Ratio of Variances: 0 Percent
Sample 1 - Sample 2

Hypothesis Test for H0: Diff = 0 Computed t statistic = 0.0413149
vs Alt: NE Sig. Level = 0.969025
at Alpha = 0.05 so do not reject H0.

Multiple range analysis for sults by group

Method: 95 Percent Scheffe

Level	Count	Average	Homogeneous Groups
2	3	623.00000	*
1	3	633.00000	*

WORK DAYS LOST

Two-Sample Analysis Results

		Sample 1	Sample 2	Pooled
Sample Statistics:	Number of Obs.	3	3	6
	Average	10.7667	17.3333	14.05
	Variance	8.17333	0.703333	4.43833
	Std. Deviation	2.8589	0.83865	2.10674
	Median	10.1	16.9	15.35

Difference between Means = -6.56667

Conf. Interval For Diff. in Means:		95 Percent		
(Equal Vars.)	Sample 1 - Sample 2	-11.3442	-1.78909	4 D.F.
(Unequal Vars.)	Sample 1 - Sample 2	-13.0237	-0.109645	2.3 D.F.

Ratio of Variances = 11.6209

Conf. Interval for Ratio of Variances: 0 Percent
Sample 1 - Sample 2

Hypothesis Test for H0: Diff = 0 — Computed t statistic = -3.81751
vs Alt: NE — Sig. Level = 0.0188184
at Alpha = 0.05 — so reject H0.

Multiple range analysis for lost by group

Method: 95 Percent Scheffe

Level	Count	Average	Homogeneous Groups
1	3	10.766667	*
2	3	17.333333	*

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Page 1 of 1

GROUP	Count / Exp Val / Residual	PERIOD PRE 1.00	POST1 2.00	POST2 3.00	Row Total
.00		17	17	18	52
		15.5	19.0	17.5	61.7%
		1.3	-2.1	.8	
1.00		8	14	10	32
		9.6	11.8	10.9	38.3%
		-1.3	2.1	-.8	
Column Total		25	31	28	84
		29.8%	36.5%	33.7%	100.0%

Chi-Square	Value	DF	Significance
Pearson	.98861	2	.60999
Likelihood Ratio	.98399	2	.61140
Mantel-Haenszel test for linear association	.02247	1	.88084

Minimum Expected Frequency - 9.617

EXPENSE SUPPLIES

Two-Sample Analysis Results

		27 33 26	32 33 23	Pooled
Sample Statistics:	Number of Obs.	3	3	6
	Average	28.6667	29.3333	29
	Variance	14.3333	30.3333	22.3333
	Std. Deviation	3.78594	5.50757	4.72582
	Median	27	32	29.5

Difference between Means = -0.666667
Conf. Interval For Diff. in Means: 95 Percent
(Equal Vars.) Sample 1 - Sample 2 -11.3837 10.0504 4 D.F.
(Unequal Vars.) Sample 1 - Sample 2 -11.9445 10.6111 3.5 D.F.

Ratio of Variances = 0.472527
Conf. Interval for Ratio of Variances: 0 Percent
Sample 1 - Sample 2

Hypothesis Test for H0: Diff = 0 Computed t statistic = -0.172774
vs Alt: NE Sig. Level = 0.871219
at Alpha = 0.05 so do not reject H0.

Multiple range analysis for cost by group

Method: 95 Percent Scheffe

Level	Count	Average	Homogeneous Groups
1	3	28.666667	*
2	3	29.333333	*

Page 1 of 1

GROUP	Count / Exp Val / Residual	PERIOD PRE 1.00	POST1 2.00	POST2 3.00	Row Total
.00		32	33	23	88
		29.8	33.4	24.8	50.6%
		2.2	-.4	-1.8	
1.00		27	33	26	86
		29.2	32.6	24.2	49.4%
		-2.2	.4	1.8	
Column Total		59	66	49	174
		33.9%	37.9%	28.2%	100.0%

Chi-Square	Value	DF	Significance
Pearson	.58449	2	.74659
Likelihood Ratio	.58504	2	.74638
Mantel-Haenszel test for linear association	.57552	1	.44808

Minimum Expected Frequency - 24.218

TOTAL SUPPLIES

Two-Sample Analysis Results

		300 377 302	279 291 245	Pooled
Sample Statistics:	Number of Obs.	3	3	6
	Average	326.333	271.667	299
	Variance	1926.33	569.333	1247.83
	Std. Deviation	43.89	23.8607	35.3247
	Median	302	279	295.5

Difference between Means = 54.6667
Conf. Interval For Diff. in Means: 95 Percent
(Equal Vars.) Sample 1 - Sample 2 -25.4413 134.775 4 D.F.
(Unequal Vars.) Sample 1 - Sample 2 -35.673 145.006 3.1 D.F.

Ratio of Variances = 3.38349
Conf. Interval for Ratio of Variances: 0 Percent
Sample 1 — Sample 2

Hypothesis Test for H0: Diff = 0 Computed t statistic = 1.89535
vs Alt: NE Sig. Level = 0.130939
at Alpha = 0.05 so do not reject H0.

Multiple range analysis for expse by group

Method: 95 Percent Scheffe

Level	Count	Average	Homogeneous Groups
2	3	271.66667	*
1	3	326.33333	*

GROUP	Count / Exp Val / Residual	PERIOD PRE 1.00	POST1 2.00	POST2 3.00	Row Total
	.00	279	291	245	815
		263.0	303.5	248.5	45.4%
		16.0	-12.5	-3.5	
	1.00	300	377	302	979
		316.0	364.5	298.5	54.6%
		-16.0	12.5	3.5	
	Column Total	579	668	547	1794
		32.3%	37.2%	30.5%	100.0%

Chi-Square	Value	DF	Significance
Pearson	2.80442	2	.24605
Likelihood Ratio	2.80177	2	.24638
Mantel-Haenszel test for linear association	1.35690	1	.24408

Minimum Expected Frequency - 248.498

QUALITY INDEX

Two-Sample Analysis Results

		.67 .67 .65	.27 .31 .27	Pooled
Sample Statistics:	Number of Obs.	3	3	6
	Average	0.663333	0.283333	0.473333
	Variance	1.33333E-4	5.33333E-4	3.33333E-4
	Std. Deviation	0.011547	0.023094	0.0182574
	Median	0.67	0.27	0.48

Difference between Means = 0.38

Conf. Interval For Diff. in Means:		95 Percent	
(Equal Vars.)	Sample 1 - Sample 2	0.338597 0.421403	4 D.F.
(Unequal Vars.)	Sample 1 - Sample 2	0.332018 0.427982	2.9 D.F.

Ratio of Variances = 0.25

Conf. Interval for Ratio of Variances:	0 Percent
Sample 1 - Sample 2	

Hypothesis Test for H0: Diff = 0	Computed t statistic = 25.4912
vs Alt: NE	Sig. Level = 1.40653E-5
at Alpha = 0.05	so reject H0.

Multiple range analysis for qual by group

Method: 95 Percent Scheffe

Level	Count	Average	Homogeneous Groups
2	3	.2833333	*
1	3	.6633333	*

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t-tests for independent samples of GROUP Group

Variable	Number of Cases	Mean	SD	SE of Mean
FTST Quality F-Tst				
Control Groups	3	99.0000	1.732	1.000
Treatment Groups	3	105.0000	8.660	5.000

Mean Difference = -6.0000

Levene's Test for Equality of Variances: F= 9.846 P= .035

	t-test for Equality of Means				95%
Variances	t-value	df	2-Tail Sig	SE of Diff	CI for Diff
Equal	-1.18	4	.305	5.099	(-20.162, 8.162)
Unequal	-1.18	2.16	.353	5.099	(-27.939, 15.939)

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	Count / Exp Val / Residual	PERIOD PRE 1.00	POST1 2.00	POST2 3.00	Row Total
GROUP	.00	27 28.1 -1.1	31 29.3 1.7	27 27.5 -.5	85 29.9%
	1.00	67 65.9 1.1	67 68.7 -1.7	65 64.5 .5	199 70.1%
	Column Total	94 33.1%	98 34.5%	92 32.4%	284 100.0%

Chi-Square	Value	DF	Significance
Pearson	.21559	2	.89781
Likelihood Ratio	.21473	2	.89820
Mantel-Haenszel test for linear association	.00915	1	.92378

Minimum Expected Frequency - 27.535

VITA

Andrejs A. Ozolins

Candidate for the Degree of

Doctor of Education

Thesis: A STUDY COMPARING THE LEVELS OF PERFORMANCE OF EMPLOYEE INVOLVEMENT TEAMS TO THOSE OF TRADITIONALLY SUPERVISED EMPLOYEES DOING THE SAME WORK

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Biographical:

Personal Data: Born in Jelgava, Latvija, son of Erna and Alexandris Ozolins. Immigrated to the United States in 1950.

Education: Graduated from Shortridge High School, Indianapolis, Indiana; received Bachelor of Science degree from the Indiana University School of Business, with a major in Finance and Economics, at Bloomington, Indiana, in June 1966; received Master of Business Administration degree from Fairleigh Dickinson University, Madison, New Jersey in 1972; completed requirements for Doctor of Education degree at Oklahoma State University in December 1992.

Professional Experience: Manufacturing Director at a major electronics manufacturing facility in Oklahoma. International assignments in Saudi Arabia, Korea, and Taiwan. Member of the leadership team that received the Malcomb Baldrige National Quality Award, received the OSHA STAR Safety Award and received ISO 9002 Certification in 1992. Guest lecturer at the University of Central Oklahoma and at Oklahoma City University.