CEO

The Quality Circle and its Variations

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Abstract

The academic and practitioner literature on quality circles (QC's) is reviewed. The review examines QCs as a social phenomenon; reviews performance and attitudinal outcomes; and considers persistence and life cycle issues. Organizational, design, and environmental contingencies that bear on QC effectiveness are indicated. Future directions for research and practice.

THE QUALITY CIRCLE AND ITS VARIATIONS

The quintessential quality circle success story tells of a group of workers who struggle with a vexing organizational problem that managers and staff specialists have ignored or been unable to resolve. The group is successful, giving its members a great deal of satisfaction and saving the organization a large sum of money. For example, a quality circle (QC) in an auto assembly plant finds that a supplier's defective tire stems are causing flat tires on cars still in the factory; solving the problem saves the company $225,000 (Cole, 1979). A quality circle at Nashua Corporation realizes that a thinner coating on carbonless paper can improve quality and save $500,000 annually ("Can quality circles boost your productivity?," 1981). According to an oft-repeated tale, a Westinghouse white collar circle saves over $600,000 by suggesting that suppliers be forced to stop overshipments (Arbose, 1980; Bocker & Overgaard, 1982; Dewar, 1982b; Wayne, Griffin, & Bateman, 1986).

Stories such as these have helped fuel an astonishing increase in the use of quality circles in the U.S. During the last decade, a variety of societal, economic, and historical forces have converged to turn quality circles into a social movement (Cole, 1982, 1985). In that time, QCs have spread from a few U.S. companies to thousands, and from a few dozen workers to hundreds of thousands. Quality circles doubtless have become the most popular form of participative management in American history.

Social scientists have played minor roles in the quality circles saga. Until recently, they had relatively little to offer in the way of theory or empirical research on QCs. That situation is changing quickly. At the time of this review, some eighteen theoretical, empirical, and review articles on quality circles had been published in refereed scientific journals. The recent scientific literature, in combination with the much larger practitioner

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literature on quality circles, offers a number of insights into the nature, strengths, weaknesses, and design of QCs.

This review will consider several issues. First, we will examine QCs as a social phenomenon. Second, we will review the QC model and its basis in theory. Next, we will review the performance and attitudinal outcomes of QCs, as well as persistence and life-cycle issues. Then, we will consider organizational and design contingencies that bear on QC effectiveness. This will be followed by a review of environmental factors that influence effectiveness. Finally, we will examine future directions for research and practice. We will begin by examining why quality circles have become so popular in the U.S.

Quality Circles as a Social Phenomenon

History of the QC Movement

A quality circle is a small group of employees from a common work area who get together regularly to identify and generate solutions for problems they encounter in their work situation. Later in this paper, we will consider specific characteristics of QCs that distinguish them from other types of participative groups. Here we will note that participative decision making groups of various kinds have been used for decades in the U.S. For example, suggestion-making groups resembling quality circles have been used in organizations with Scanlon plans and other gainsharing plans since the 1930s. However, such groups never became widespread in the U.S. until the advent of QCs. For this reason, historical accounts of the QC movement (Cole, 1979, 1980b, 1985; Cole & Tachiki, 1984; Dewar, 1982b; Munchus, 1983) have emphasized the Japanese origins of quality circles.

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The transformation of Japanese manufacturers from low-cost, low-quality producers to high-quality, high-margin producers is a familiar story. Two Americans, W. Edwards Deming and Joseph Juran, provided some of the tools and much of the advice that helped Japanese industry shift its emphasis toward quality improvement during the 1950s. The Japanese modified American methods, however, so that quality became the responsibility of blue collar employees as well as engineers and managers.

Starting in 1961, the Japanese Union of Scientists and Engineers (JUSE) helped extend these ideas by advocating the use of quality circles. The number of QCs grew steadily, so that by the late 1970s about 50 percent of Japanese firms with over 30 employees were using small employee decision-making groups. Some 200,000 quality circles, involving 1.7 million employees, were formally registered with JUSE; perhaps four times as many groups were unregistered (Cole, 1979). Yager (1980) estimated that one-fourth of Japanese hourly employees were members of registered or unregistered quality circles.

In 1973, a group from Lockheed's Missle Systems Division visited Japan to learn about Japanese manufacturing methods. They were inspired by the quality circles they saw, and the next year began the first formal quality circles in the U.S. Honeywell and later other companies in the aerospace industry followed with their own QC programs. The original proponents of quality circles at Lockheed (including Wayne Reiker, Donald Dewar, and James Beardsley) left the company in 1976 and became well-known private consultants. Although the Lockheed program languished and eventually died, the QC movement took off elsewhere. Later, QCs were reintroduced at Lockheed as well.

The International Association of Quality Circles (IAQC) was formed in 1977, with Dewar as its first President, to foster the spread of the movement. The IAQC began to publish a magazine (Quality Circles Journal), to distribute publications, and to conduct conferences and training programs. By 1985 over

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7000 companies were members of IAQC. There also were over 200 registered consultants.

By the late 1970s, U.S. corporations began to experience a whole range of economic, social, and technological pressures on performance that have yet to dissipate. These problems increased the felt need for trying new ways of managing. Of particular importance for the history of quality circles was the emergence of the Japanese as formidable competitors in world markets. Japanese companies took market share away from domestic companies in industry after industry. Attention was focused on management practices that seemingly provided clues to the Japanese success. Two books about Japanese management became best-sellers in the early 1980s (Ouchi, 1981; Pascale & Athos, 1981), leading to a flood of articles and books on the topic.

These conditions gave quality circles a major boost. QCs were especially appealing because they were one Japanese management practice that could be adopted quickly, easily, and with relatively little disruption to the organization as a whole. QC programs were marketed as standardized programs complete with a price tag that included training, support materials, procedures, and consulting assistance. Managers knew what they were purchasing and how much it cost. Because circle programs did not involve everyone, managers controlled the amount of activity and its cost. Finally, many managers were willing to adopt QCs because they did not seriously challenge management authority. It is not uncommon, in our experience, to hear managers say that they had little to lose--that any positive outcome was a bonus since the organization was investing so little. These circumstances, coupled with widespread reports of QC success, created ever-increasing interest in quality circles.

Incidence of Use

There are no solid data on the total number of quality circles or the total number of QC members in the U.S. However, the available data suggest that usage is extensive. One study found that 65 percent of companies with over 25,000 employees used such programs, and that most had started their programs within the previous two years (New York Stock Exchange, 1982). A Conference Board study (Gorlin & Schein, 1984) indicated that forty out of fifty-two companies in the study used QCs. Ingle & Ingle (1983) estimate that some 4000 American companies use quality circles. Our estimate is that there currently are several hundred thousand QC members in the U.S.

Although quality circles can now be found in a great many organizations, the incidence of use is higher in some organizations than others. The QC program in some cases involves only one or two circles, while other companies have made especially extensive use of circles. Approximately ten percent of Westinghouse employees and five percent of Honeywell employees were members of QCs at one point ("Will the slide kill quality circles?", 1982). IBM, TRW, Westinghouse, DEC, Xerox, and Hughes Aircraft are among other heavy users of the QC approach. Usage across industries is also uneven. The greatest use has been made in the aerospace industry, where QCs began in the U.S., and in industries such as autos, steel, and consumer goods that have faced the stiffest competition from the Japanese.

Many observers have suggested that QCs may become just one more short-lived management fad. Although many quality circle programs die out, as we shall see, there is no persuasive evidence at this point that the overall level of QC use is declining.

What are Quality Circles?

Design Characteristics of QCs

Most QC programs use a fairly standard set of design features, although each organization tends to do a certain amount of fine tuning so that the design fits the context in which circles are being implemented. The standard design characteristics of QCs include the following.

1. __Voluntarism.__ Membership is voluntary.

2. __Membership.__ Members are drawn from a particular work group or department. However, usually not all employees in the work group or department are included in the QC; representatives are chosen if there are more volunteers than there are positions available (usually, there are no more than ten members of each circle).

3. __Decision Making Power.__ The group has the responsibility for making suggestions but does not have the authority to make decisions. It submits suggestions to an appropriate manager or management group, which may be a specially constituted steering committee.

4. __Goals/Agenda.__ The problem solving domain is limited to quality- and productivity-related issues and cost reduction. This set of goals is borrowed from the Japan, where 90 percent of QCs focused on quality control, productivity, and cost issues (Ishikawa, 1968). In contrast to some other types of decision making groups, there is no broad authority to look at ways in which the organization could operate more effectively or to improve employees' quality of work life. However, advocates of QCs expect the groups to serve a wide variety of indirect goals, such as greater communication within and across organizational units, enriched jobs, increased skill development, and positive changes in such employee attitudes as job satisfaction, organizational commitment, motivation.

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5. **Meetings.** Meetings are usually held on company time. Typical schedules call for an hour of meeting time per week or two hours biweekly.

6. **Training.** QCs receive training in group process and problem-solving techniques, and in some cases receive training in statistical process control. Standard packages are commonly used that provide between ten hours and a week of training.

7. **Facilitation.** A staff of specially trained facilitators usually is hired to help with training, facilitation of group process at meetings, and performing staff functions associated with the QC process (such as maintaining communication links, etc.).

8. **Rewards.** No financial rewards for group suggestions are offered, except through the normal company suggestion process. Recognition awards, such as banquets, trophies, gifts of nominal value, pictures on the wall, and so on are stressed.

9. **Information Sharing.** Usually, the group is provided with no systematic information about company performance, costs, long-range plans, and other matters.

10. **Installation.** QCs exemplify the old saying that participative management is something that the top tells the middle to do for the bottom. The decision to install QCs is usually made at the top of the organization, and then circles are created at the bottom. Only after the program begins to function are middle managers involved in the program, as they are required to respond to suggestions made by the groups.

These design characteristics are similar to those used in the original U.S. quality circle program at Lockheed. They have become standard practice largely on the basis of tradition, not because empirical investigation has demonstrated that these characteristics are better than the alternatives.

The Parallel Organization Model

The nature of quality circle programs becomes much clearer if they are understood as parallel (Stein and Kanter, 1980), collateral (Zand, 1974), or dualistic (Goldstein, 1985) structures that exist side-by-side the normal bureaucratic organization. As parallel structures, they are not intended to replace the day-to-day organization, but rather are intended to supplement it by performing functions that a traditional bureaucratic structure is unable to perform well. In particular, a QC program is a parallel structure that is used to initiate change, in contrast to the normal bureaucratic organization which is oriented toward stability. Some of the QC design characteristics that illustrate the parallel nature of the QC model include use of a limited number of volunteers in a hierarchy of special groups, the lack of decision making authority granted to QCs, the use of a unique leadership structure (i.e., facilitators), and separation of the organization's financial reward system from the QC effort.

The parallel nature of quality circle programs is source of certain strengths and some very real weaknesses. The parallel character of QCs enables them to be established relatively quickly, in the form of a discrete program with bounded costs and risks. Indeed, sometimes QCs are advocated on the basis that they do not require much organizational change (e.g., Yager, 1979). On the other hand, parallel groups such as QCs often have difficulty achieving organizational legitimacy. In a real sense, they are parasites on the normal organization; QCs depend on the normal organization for personnel, time, information, and money. Like parasites of other kinds, QCs tend to arouse defenses in their hosts. We will consider these points further when we examine the effectiveness of quality circles and their sustainability.

Theoretical Basis for Claims of QC Effectiveness

Is there a theoretical basis for the belief that quality circles can be effective in increasing productivity and generating other desirable outcomes? This question has not been a major concern to most quality circle proponents. Quality circles have been developed by and for practitioners, and the evolution of QC practice has not been linked very closely to social science theory or research. Quality circles proponents have relied on a familiar set of quasi-theoretical ideas that are loosely tied to research, as well as on "common sense" (see Ferris & Wagner, 1985).

One idea is that employee participation can lead to the acceptance of change, to better understanding and consequently more effective implementation of new ideas, and to increased intrinsic satisfaction. Another idea is that group decisions often are more effective than individual decisions because multiple viewpoints are represented. "Common sense" beliefs that are frequently voiced about participation include: "The people closest to the work have the information about how to make improvements," "People want to contribute more to their organizations." Ferris and Wagner (1985) indicate that assumptions such as these by QC proponents represent oversimplifications of the research evidence. For example, groups are sometimes inferior to individuals in problem solving, the benefits of participation are inconsistently realized and are highly dependent on implementation strategy, and many employees are not interested in participation (see also Miner, 1984; Zander, 1977; Locke & Schweiger, 1979; Miller & Monge, 1986).

It is possible, however, to provide testable theoretical models of QC effectiveness that clarify why quality circles might work and that serve as guides for research and practice. Mohrman has proposed two models (Mohrman, 1982; Mohrman & Novelli, 1985) that help explain why QCs may lead to an

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increase in productivity. The two models depict different causal paths to
productivity improvement that are implicit in the QC literature.

Figure 1 depicts the first causal sequence, in which circles meet and
generate ideas, the ideas are implemented, and implementation of the ideas
leads both to positive changes in employee attitudes (such as satisfaction and
involvement) and to improvements in productivity. A number of intervening
variables may block or facilitate the steps in this causal chain. First,
leadership and facilitation of the group are expected to be crucial in the
early stages of group functioning. That is the rationale for providing groups
with a specially trained facilitator and, in many cases, for providing extra
training to nominal leaders of the group. Second, the group will not function
effectively unless the group has sufficient skills, an appropriate performance
strategy, and motivation to exert effort (Hackman and Morris, 1977). Next,
management support for the QC is critical--a point emphasized by virtually
every writer on the topic of QCs. Without management support, it is
impossible to implement the new ideas or to obtain the resources necessary to

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Insert Figure 1 about here

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develop them. If implementation of new ideas does occur, there may be
positive, negative, or neutral outcomes. There will be a positive impact on
productivity only if the ideas for change are truly relevant to and
facilitative of performance. There will be a positive impact on employee
attitudes only if the ideas lead to positive changes in the job itself, the
job context, or other individual outcomes.

Figure 2 captures a second causal sequence that is often used to indicate
how QCs affect productivity. Participation in a circle is assumed to result
in individual level outcomes such as job variety, increased skills,

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recognition from management, feelings of accomplishment and involvement, and social rewards from membership in a team. These feelings and conditions in turn lead to greater motivation and improved performance back on the job and thus to greater productivity. Indirectly, these feelings and conditions may increase productivity by enhancing job satisfaction, which leads to decreased absenteeism and turnover, and finally to improved productivity by lowering costs associated with these withdrawal behaviors (Lawler & Ledford, 1981-82).

Insert Figure 2 about here

Again, a variety of intervening variables may disrupt or facilitate the proposed chain of events. As with the causal chain depicted in Figure 1, management responsiveness and group functioning variables are important, because these factors determine whether good suggestions will be proposed and implemented and consequently whether participants will feel a sense of accomplishment. Equity considerations may be important if the individual feels that the outcomes resulting from participation are inequitably distributed (Adams, 1965). Individual differences in growth need strength may moderate the effect of individual-level outcomes on satisfaction, motivation, and task performance (Hackman & Lawler, 1971). It is also reasonable to expect that task performance and therefore productivity gains will be greatest if the skills learned in the circle are directly transferable to the work situation. Even if the individual does experience positive outcomes from being part of a successful circle, this may not lead to increased day-to-day work motivation. Value-expectancy theory (Lawler, 1970) predicts that greater effort will be applied to the activity that leads to the positive outcomes—in this case, expending more effort in QC activity.

The number of stages and the number of intervening variables in the two causal models are suggestive of how difficult it is for quality circles to enhance productivity. There are many places for the causal chains to break down or be blocked.

The two models show alternate routes by which quality circles can have a positive effect on productivity. Potentially both chains can operate at the same time. There are some key differences between the two models, however. The model depicted in Figure 1 suggests that QCs may benefit participants and nonparticipants alike, since the outcomes are the result of implementing ideas rather than direct participation. The model depicted in Figure 2 suggests that direct participation in the quality circle is needed to achieve the outcomes. This is consistent with the research evidence on participation in general (e.g., Coch & French, 1948; Nurick, 1985) and QCs in particular (Mohrman & Novelli,1985; Rafaeli, 1985). It shows that the attitudinal benefits of participation accrue more to direct participants than to nonparticipants, even if the nonparticipants are indirectly represented in the participative group.

Now that we have considered the conceptual basis for claims that quality circles can enhance productivity and other outcomes, we will examine whether in fact QCs have been shown to achieve such outcomes.

Outcomes of Quality Circles

We will examine several kinds of quality circle outcomes. First, we will examine the outcomes of QCs on their own terms: that is, success as defined in the practitioner literature on QCs. Second, we will consider whether there is specific evidence of the impact of QCs on productivity. Finally, we will briefly review other outcomes of QCs, such as attitudinal changes, that may lead to productivity improvements much less directly.

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Reports of Success in the Practitioner Literature

The practitioner literature on quality circles has many shortcomings, but it does not lack for reports of QC effectiveness. The QC literature contains innumerable stirring testimonials, success stories, and claims for astounding levels of return on investment. These stories are not concerned specifically with productivity (defined as a ratio of outputs to inputs), but the kind of cost reductions that are claimed for QCs certainly imply productivity improvements. With a few exceptions, these accounts are directed at practitioners; claims for QC success rarely have rested on research that meets scientific standards.

The literature includes many moving testimonials from those involved in the QC movement. Donald Dewar, the first President of the International Association of Quality Circles, speaks of QCs as ushering in "a new era" in the way organizations are managed, "whereby the people who do hands-on-work will be brought into the mainstream and properly recognized as a potentially more powerful and valuable resource" (Dewar, 1982b, p.1). Rendel (1981) sees QCs as part of what Alvin Toffler has termed the "Third Wave" of civilization, succeeding the era of the Industrial Revolution (Wave 2). An executive of Hughes Aircraft, quoted by Marks (1986, p.46), tells why he believes QCs have grown rapidly: "It is a spiritual reason--people want to work together. They are more effective as a team. It increases their knowledge. It increases their communication. It increases their security. It increases their dignity." In conferences, interviews, and meetings, we have heard countless impassioned statements by QC participants and their managers that remind us strongly of religious conversion experiences. Intriguing as such statements are, they cannot substitute for empirical evidence that quality circles actually lead to the claimed changes.

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Most success stories concern particular QCs that "hit a home run"--that is, proposed one solution that saved a huge sum of money. This review began with three such success stories. Also popular in the QC literature is the claim, based on an unpublished internal company study, that Lockheed's initial 15 quality circles saved $2,844,000 in the first two years of operation (e.g., Bocker & Overgaard, 1982; Yager, 1979). Proponents also often claim that quality circles generate the kind of high, riskless return on investment (ROI) that no rational manager can ignore. Arbose (1980) considers four companies in which the ROI is estimated at from five to one to ten to one. Yager (1980) indicated that ROI "typically" is between six to one and ten to one. Ingle & Ingle (1983, p.209) claimed that: "Based on experience in general, the savings to cost ratio will run about 5:1 (for every dollar invested, the organization receives $5 back). In some cases it is reported as high as 20:1 and as low as 3:1."

There are a number of problems with these success stories and eye-opening ROI reports. First, QC success stories rarely mention how costs and benefits are estimated. This is an important issue since costs and benefits are hard to estimate. When the estimating procedure is explicit, the figures usually are based on the estimated value of QC suggestions prior to implementation. Thus, the savings are "paper" savings that probably are realized only rarely (Lawler, 1986) because many suggestions are actually never implemented or are implemented only after a long period of time (Mohrman & Novelli, 1985; Wayne et al., 1986). Many suggestions are never implemented because they arouse resistance on the part of management, affected employees, or others constituencies. Sometimes suggestions turn out to be impractical, or conflict with other planned changes that were unknown to the circle. Since QCs usually work almost in an information vacuum, this is not uncommon. It may take a

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long time to implement suggestions that require budget authorization; the QC may have long since disbanded in frustration. Finally, the estimated value of suggestions often is inflated, intentionally or otherwise. Higher estimated savings bring more recognition and management attention, while later findings that the savings are not as high as anticipated are unlikely to produce any negative outcomes for the estimator.

There are other problems with the success stories in the practitioner literature. Stories of huge savings generated by a single group may imply that the overall QC effort is highly successful, when in reality most circles may fail to accomplish anything (Mohrman & Novelli, 1985; Wayne et al., 1986). Finally, there is doubtless a tendency to emphasize success stories rather than failures in the practitioner literature, as there is in the academic literature on organizational change (Mirvis & Berg, 1977). Although some failures have been reported in the practitioner literature (e.g., Burck, 1981; Cook, 1982; Metz, 1981; Meyer & Stott, 1985), it is difficult to know from the the literature how likely an organization is to experience success rather than failure.

Research on the Impact of QCs on Productivity and Other Outcomes

There is relatively little empirical evidence of the effectiveness of quality circles, as a number of observers have noted (Ferris & Wagner, 1985; Head, Molleston, Sorensen, & Gargano, 1986; Ramsing & Blair, 1982; Wayne et al., 1986). A recent review of the literature was highly critical of the quality of the available studies (Steel & Shane, 1986), and urged that premature conclusions not be drawn on the basis of the existing body of evidence. The reviewers indicated:

> The majority of studies constituting the quality circle evaluation literature are, at best, seriously flawed and, at worst, potentially misleading. If the level of scientific rigor found in other field research domains such as job redesign, survey feedback, and goal setting may be employed as a yardstick, then the quality circle

literature exhibits generally inferior quality (Steel & Shane, 1986, pp.450-451).

There is no question that the QC literature could benefit from more empirical investigations. The present paper references some 112 citations that are specifically concerned with quality circles. Of these, over 70 percent (80 references) are directed primarily at practitioners. One indication of the status of the QC literature is that the number of how-to-do-it books (17, or 15 percent) is exceeded by the number of refereed journal articles (18, or 16 percent) only if we include in the latter two reviews of how-to-do-it books that have appeared in Administrative Science Quarterly!

The few evaluation studies measuring performance show no clear trend for or against an productivity effects of quality circle programs (Steel & Shane, 1986). Marks, Mirvis, Hacket, & Grady (1986) collected data from a period 6 months before to 24 months after adoption of a QC program in a machining operation. QC members showed a significant increase in percentage of hours spent on production, efficiency levels, and work quality, and showed a significant decrease in absenteeism. Mohrman & Novelli (1985) tracked six performance measures at four-week intervals from one year prior to the program to one year after the start of a QC program in a warehouse operation. They found indications of a slightly more positive trend in the experimental unit compared to the control unit on the set of productivity measures (costs, throughput costs, labor costs as a percentage of total costs, overtime costs, absenteeism, and accident rates). Although the effects were slight and may have been due to other organizational changes that were being installed at the time, the data indicate that productivity never declined even temporarily as a result of the program. Jenkins & Shimada (1983), in a study of 450 production personnel, found that productivity was higher on three of four criteria

(production quantity, quality, and rework costs) for QC members than nonmembers.

On the other hand, Harper & Jordon (1982) found no significant difference in productivity between ten QC and ten non-QC groups in one organization. Atwater & Sander (1984) conducted an eight-month study of eleven QC and control groups in three U.S. Navy organizations, and found no evidence of any significant effect of QCs on number of suggestions, accident rates, absenteeism, or promotions. Overall, then, some studies have found that productivity and other objective measures are positively impacted by QCs, while other studies show no effect. No study shows a serious negative effect on performance measures.

Most of the few available evaluation studies report only attitudinal data. The evidence for attitudinal effects of QCs is equivocal, although slightly more extensive than the evidence for performance effects. Steel, Mento, Dilla, Ovalle, & Lloyd (1985) studied attitudes in a hospital and a maintenance unit with QC programs. They found significant positive effects on 7 of 20 measures in the latter case but no positive effects--indeed they found negative trends--in the former. Marks et al. (1986) found positive effects for QC participants relative to control subjects, but only in areas directly related to QC activity (such as suggestions offered, decision making opportunities, group communication, and skills needed for advancement, satisfaction with opportunities for accomplishment, and satisfaction with opportunities for advancement). Attitudes concerning job characteristics (meaningfulness of work, job challenge, and job responsibility) and organizational communication were unaffected. Similarly, Rafaeli (1985), in a cross-sectional study of 455 QC members and 305 non-members in a manufacturing organization, found significant differences favoring members on measures of

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perceived influence and task variety, but not differences on other job characteristics or on job satisfaction. The possibility of selection biases (that those who volunteered to become participants were more favorable on perceived influence and task variety to begin with) cannot be ruled out in the study. Hocevar & Mohrman (1985), in a cross-sectional study of a police precinct that had QCs, found that QCs were perceived to have a slight positive impact on feelings of involvement, participative decision making, and work systems and procedures. Again, the cross-sectional design makes it impossible to determine the direction of causality. In a cross-sectional study, Wayne et al. (1986) found that members of more effective QCs had more favorable attitudinal outcomes (job satisfaction, intrinsic satisfaction, satisfaction with co-workers, and organizational commitment) than members of less effective QCs. This may be an indication that individual with high morale make better team members, or it may suggest that the level of effectiveness of the QC moderates the impact of QC membership on outcomes, as our earlier model suggested. Finally, Atwater & Sander (1984), Harper & Jordon (1982), and Head, Molleston, Sorensen, & Gorgano (1986) found no effects of QCs on attitudinal outcomes such as job satisfaction.

Both Marks et al. (1986) and Mohrman & Novelli (1985) found evidence of a "buffering" effect of QC membership on attitudes. In both cases, the attitudes of control or comparison groups declined, probably as a result of disruptions imposed by the organization's environment. In the Marks et al. study, attitudes of QC members did not decline as in the comparison groups. In the Mohrman & Novelli study, attitudes of QC members declined but not as sharply as attitudes of nonmembers. This suggests that QC programs can have some desirable effects, but are not a strong enough intervention to overcome environmentally imposed adversity.

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In addition, Mohrman & Novelli (1985) found that the attitudinal outcomes of former members of QCs were in some cases worse than those of nonmembers. This is an important issue, because it bears on the long-term viability and impact of the parallel organization model. The hope of proponents of the parallel organization model is that the positive benefits of participation will be maintained while membership in QCs is rotated to those who have not previously had the opportunity for participation. If positive effects of membership are lost once membership ceases, then the effects of QCs will be quite limited.

Overall, the evidence available so far suggests that QCs do not have very powerful effects on attitudinal outcomes such as job satisfaction and commitment. Negative effects of QCs have less commonly been reported than neutral effects or positive effects. There are some indications that QCs affect attitudes that are directly relevant to the intervention (such as perceived influence), even when they do not show evidence of affecting attitudinal outcomes. A surprising area of neglect in the literature is attitudes toward the intervention itself, including perceptions how well the intervention was implemented (the equivalent of a manipulation check in laboratory research) and perceptions by participants and nonparticipants of whether the intervention had any impact.

Sustainability of QCs

Persistence and Life-Cycle Issues

Even when quality circle programs seem to experience initial success, the programs often die. For example, the famous Lockheed program that helped launch the quality circle movement in the U.S. died within a few years of its beginning (Burck, 1981), despite claims that it saved millions of dollars for Lockheed. Meyer & Stott (1983) recounted their experience with two companies

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in which the QC effort languished despite early success. In one case, the company realized an estimated $576,000 of annualized savings over the first two years, there was a reported 3-to-1 return on investment, attitudes were very positive, and initial enthusiasm was "to the point of evangelical fervor." Yet after four and a half years, individual circles could not be sustained; the longest running circle survived 2.5 years, and the average age of continuing circles was 1.5 years. Mohrman and Novelli (1985) reported a similarly discouraging story of early financial success, fervent testimonials, and stagnant circles. Portis, Ingram, & Fullerton (1985) conducted ten case studies of organizations adopting QCs, and found that it was very difficult to sustain circle activity for more than two years. Cook (1982) and Smeltzer & Kadia (1985) also suggested that the failure rate in QC programs is high. In our experience, it is very rare to encounter quality circle programs that survive in pure form for more than five years.

A Model of the QC Life Cycle

An understanding of why it is difficult to sustain quality circle programs can be gained by examining the typical life cycle of a program. Our experience indicates that quality circles go through a series of identifiable phases or stages of development (Lawler & Mohrman, 1985). Each phase has its own key activities as well as its own threats to the continuation of the QC program. Quality circle programs that survive the threats of the first stage move to the second stage, and so forth. That is, the organization either drops the program at one of the stages or moves on to the next one.

1. _Start-up Phase._ During the start-up phase, a high level of activity is demanded and considerable effort needs to be put into a QC program. The program usually begins with a communication program and a call for volunteers.

At this point, it is also important to identify who the facilitators will be and to be sure that they are trained and capable. In addition, an intensive training program in group process and problem-solving skills is often conducted for the circle members.

Insert Figure 3 About Here

The primary threats to QCs in this phase concern whether anyone will volunteer, whether adequate training will be provided, whether the problem solving capability of the volunteers will be adequate, whether competent facilitators can be found and finally, whether an adequate budget will be made available to allow for meetings, facilitator time, and training. Most quality circle programs deal successfully with this stage and are able to progress to the next phase. This is aided by the availability of good training packages for QC participants and by the appeal of participating in problem solving groups for most employees. In fact, the danger is that the high level of enthusiasm creates expectations that cannot possibly be met. Setting up the groups is a relatively straightforward process. Moreover, deficiencies in start-up activities generally do not become apparent until later stages.

2. <u>Initial</u> <u>Problem</u> <u>Solving</u>. In this phase, circles identify the problems that they will work on and begin to come up with solutions. Most groups successfully identify problems and begin problem solving. Once they begin, they may find that they have inadequate business and technical knowledge, but this too can be overcome through additional training or by adding expertise to the group, sometimes in the form of resource people. Therefore, in most quality circles, early success in problem solving is experienced.

3. _Presentation_ _and_ _Approval_ _of_ _Solutions_. Because QCs are a parallel structure, the results of QC problem solving activities must be reported back to decision makers in the line organization. This report-back activity is often perceived by the participants and managers alike as the high point of the entire circle process. It is also critical to the evolution of the program. If circles are to succeed, the reporting back must be done well and the line organization must respond quickly, knowledgeably, and in a significant percentage of the cases, positively to the ideas coming out of the quality circle program. It is during this phase that the typical QC program encounters the first serious threats to its continuation.

Most of the individuals who have to accept and act on suggestions from QCs are middle managers and staff personnel. In many organizations they have had little or no role in the program until this point. Indeed, they may have little experience soliciting and responding to ideas from subordinates. They are often presented with ideas that they or other people feel they should have thought of themselves or with ideas that will change their own work activities.

Part of the problem in obtaining adequate responsiveness to QC suggestions is that the people who must respond have competing priorities, and as a result they may not have the time available to respond. In any case, a scenario can develop in which the circles present their ideas and literally no activity follows on the part of the people to whom they were presented. This is particularly likely to happen to circle suggestions that follow the first round of presentations to management. There is often a special urgency to show responsiveness to early suggestions, but subsequent ideas often are received far less positively.

If their ideas are not accepted, QC participants become discouraged and may feel that the program is a sham, waste of time, and a management trick. If there is a negative response or no response to a high percentage of circle suggestions, the program usually ends. Individuals in the group become discouraged and stop meeting. They may react against the whole idea of the QC program and believe that management never took the program seriously. If, however, ideas are accepted, then the circle moves to the next phase.

4. <u>Implementation of Solutions.</u> Many initial QC ideas may be accepted because the pressures for acceptance are quite strong. However, many of these ideas may be accepted but never implemented. Those who must devote time, energy, and resources to implementing the suggestions may not be involved in or committed to a circle's suggestions. Engineering, maintenance, and middle management groups often are faced with a choice between continuing their normal activities and picking up on ideas that have been suggested to them by the quality circles. Thus they often lack the necessary motivation to act on the suggestions.

Failure of the organization to implement circle ideas can cause the QC program to lose momentum and die. Although participants are delighted to have their ideas officially approved, this is not sufficient to reinforce QC activity. They need to see implementation of their ideas and receive feedback on the impact of their suggestions. Failure to provide both implementation and feedback will ultimately lead to deterioration and cessation of the program. Many but not all organizations successfully implement some of the ideas of the QC program, make projections of large savings based on them, and move on to the next phase.

5. <u>Expansion and Continued Problem Solving.</u> During this phase the program is often expanded to include new groups. Old groups are either phased out or told to work on new and additional problems. If the program

has gotten this far, then there is usually considerable commitment of resources to it and it becomes a major operating part of the organization. More facilitators are hired, and more groups are started and trained. An administrative structure develops to support circle activities. Circles are a program that requires maintenance of and investment in the parallel organization.

The initial success of the program leads to a desire of other people to get into the QC program. Nonparticipants become jealous of participants and wonder why they too cannot have the luxury of meeting and problem solving while others are working. They also may resent the recognition and status accorded to successful QC members. To some degree this issue can be met by expanding the number of groups, but there almost always is an insider-outsider culture.

At this point the members of the initial groups often develop aspirations for further development. For example, they may desire greater upward career mobility and/or additional training and technical skills. They may desire to transfer the QC approach back into the everyday activities of the organization. Circle members become uncomfortable with the split between the way they are treated in the parallel organization and the way they are treated in normal day-to-day operations. They ask for more participative management as their sense of competence increases and their aspirations for influence rise.

Some groups run out of problems to solve. Initially, they pick off the easiest ones to solve. They then find themselves in a situation where, with the limited charter and training they have, there is little more they can do. They may react to this by simply going out of existence, or they may try to expand their activities into new topic areas that are out of line with their mandate.

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Initial success may also bring requests for financial rewards from the participants. This is especially likely when organizations trumpet their success and the high savings circles have produced for the organization. Ironically, the more publicly the organization measures and reports on the costs and benefits of the program, the more likely employees are to develop a desire to share in the claimed financial gains.

Expansion may also bring to a head issues of the cost of running the program and the parallel organization needed to operate it. Ultimately, many organizations ask whether the cost in time and money is justified by the savings that have been realized. Partially because circle ideas are not implemented or because there is not sufficient follow-up to ensure continued utilization of new procedures, savings often turn out to be somewhat smaller than had originally been estimated. A combination of disappointment over the smaller actual savings from early ideas and the significant expense of running the QC program often provides the single most serious threat to its continued existence and sets the stage for the decline that usually follows.

6. <u>Decline</u>. Although some QC programs and particular circles within a program may survive for years, many others gradually decline. Groups begin to meet less often and become less productive, and the resources committed to the program are decreased. Often the main reason for group persistence is the social satisfaction the group brings to group members, rather than because of their problem-solving effectiveness. As the organization begins to recognize this, it cuts back further on resources and as a result the program starts to decrease in size. The people who all along have resisted the QC program recognize that it is losing power and they openly reject and resist it. The combination of more effective resistance on the part of middle and staff managers, the decreasing budget, and decreasing participant enthusiasm can lead to the rapid decline and ultimate cessation of the program.

In summary, then, our analysis of the phases that QC programs go through suggests that there are many threats to their continued existence. Because of these threats, it is likely that few programs will be institutionalized and sustained over a long period of time.

Ironically, the demise of QC programs results from the very design features that make the concept attractive to managers in the first place-- namely, its parallel nature. Even in organizations that have maintained some QC activity for as long as ten years, we have found that it remains "extra" and outside of the normal organizational routine. As such, the primary challenge is to maintain energy and enthusiasm among the various parties whose active involvement is essential to circle accomplishments. This is difficult when the work is seen as an extra activity.

Conclusion

Our experience indicates that in the long run, the QC program must be responsible for producing ideas that are implemented and that improve organizational performance if it is to be taken seriously by managers or, for that matter, workers. Human relations victories and more communication are not enough. Yet, several design features of QC programs reduce the likelihood that circles will effect significant changes. First, as an activity that is parallel to the organization, QC activity is not seen as a required part of anyone's job. In busy times, circle activity is often seen as a burden. Second, QCs can accomplish nothing on their own; they have no budget, no authority to implement, no ability to command a response. Indeed, QC programs tend to exclude those who must implement circle suggestions--namely, middle managers and staff personnel. Third, the entire organization usually is not given training in group process and problem solving skills. Thus, the skills of participants remain "special" and potentially nontransferable to the normal

organization. Finally, circles usually are tightly restricted in their ability to examine the kinds of issues that may result in truly significant, and thus potentially efficacious, organizational changes. They are generally confined to discovering inefficiencies of method, equipment, and communication within their work area; they are usually denied opportunities to question personnel policies, division of labor and job design, management treatment of employees, the reward system, training, or promotional practices.

Returning to the two models of QC efficacy that were presented in Figures 1 and 2, it can be seen that there is a common progression of events in QC programs that blocks both causal chains. This set of events can prevent members from experiencing the satisfaction and a sense of accomplishment that results from being part of a successful problem solving and change implementation process. It can also prevent employees and the organization from experiencing the benefits of successful change.

It appears, then, that the very design of QC programs insures that their survival is unlikely. This leads us to another issue that has received attention in the literature: whether QCs may serve as a starting point for organizations that are attempting to build a culture of high employee involvement.

QC Programs as a Transition toward Other Forms of Participation

Some attention has been devoted to whether QCs can serve as a transition vehicle toward other forms of participative management. It is beyond the scope of this paper to consider this issue in any detail. We can note, however, that there are three ways in which it is possible to move beyond QC programs (Lawler & Mohrman, 1987). One possibility is to develop other types of parallel structures, such as task forces, that permit employee participation in such areas as strategy, organization design, and operations. A second possibility is to move in the direction of self-managing work teams,

to which various kinds of responsibilities are delegated (see also Sims & Dean, 1985). A third possiblity is to alter various aspects of the organizational context to support QCs more successfully (see also Meyer & Stott, 1985). We will discuss more implications of the last possibility in the next section.

Design Characteristics and QC Effectiveness

The literature contains are few serious discussions of the relationship between factors in QC program design and the organizational context that promote or undermine QC effectiveness. Most of the available treatments are relatively narrow in scope, focusing on two or three factors such as the importance of management commitment to the QC effort. Klein (1981), for example, suggests that important factors in QC success include job security and trust between management and employees. Wayne et al. (1986) found that group cohesion and performance norms showed a positive relationship to QCs' ability to make and implement suggestions. Steel and Shane (1986) argue that QC effectiveness depends on compatibility of the intervention and attributes ofthe organization; the level of QC progam demands on tangible and intangible resources; and the type of response desired from participants. Overall, however, there has been little attempt to generate more inclusive models or to build on prior research in considering design contingencies.

A Model of Design Effectiveness

We have proposed and conducted research on a relatively comprehensive framework for assessing design factors that influence QC effectiveness (Mohrman & Ledford, 1984, 1985). The model is shown in Figure 4. The model is based on the assumption that QCs (and other participation groups) must be designed to attain both internal competence and external effectiveness.

Internal competence is reflected in the groups' functioning and ability to solve problems. Standard QC consulting packages focus most of their effort on group functioning. Specific group functioning variables that may be important for QCs include goal clarity, which is an indicator of group performance stratgegy; intensity of effort, reflecting motivation; and group skill at problem solving (Hackman & Morris, 1975). High levels of group conflict may also be important as an indicator of destructive group process.

External effectiveness is reflected in the groups' ability to deal effectively with the normal operating organization so that the groups can sustain themselves and foster the implementation of suggested changes. Our previous analysis of the parallel nature of QCs indicates why we believe that this kind of effectiveness is also crucial. We considered five contextual variables that are repeatedly suggested as important in the QC literature: management responsiveness, recognition given to the QCs and the QC program, support for the program across a broad range of constituencies, communication about the program, and representation of the views of nonmembers in group decisions.

The model considers a number of particular design characteristics of participation groups. These are reflected in the QC model we have previously reviewed. We considered goal characteristics (broad versus narrow goals and use of measurable performance goals); membership characteristics (use of volunteers verus use of intact work groups and breadth of membership opportunities); use of a facilitator; level of training provided; diversity of membership (variety of organizational constituencies included as members); diversity of outside resource personnel used; methods used to provide recognition of group accomplishments; use of management-level groups to support and assist the participation groups; use of multiple communication channels; record-keeping; and meeting frequency.

The model depicted in Figure 4 begins with the design characteristics of participation groups such as QCs, and suggests that these characteristics can affect outcomes in two ways: by facilitating the internal functioning of the group (internal effectiveness) and/or by enhancing its integration with its organizational context (external effectiveness). In turn, these factors lead to two kinds of outcomes. First, some outcomes are relevant to the groups themselves, such as whether they experience accomplishments or frustration. Second, some outcomes concern the QC program, such as the level of impact on organizational goals, impact on employee goals, degree of permanence of the program, and ratings of overall effectiveness.

The authors conducted a large-scale study of participation groups in nine organizational units of a large multidivisional firm (Mohrman & Ledford, 1984, 1985). The model provided an organizing framework for data collection. This study offered some major advantages in assessing the model presented in Figure 4 and in assessing the importance of specific QC design factors. Most importantly, the diversity of the participation programs provided us with a naturally occurring field experiment. All nine research sites used a parallel organization model, but there was considerable variation across and within sites on the specific design features that were used. For example, the composition of the groups, kinds of training provided, and level of use of facilitators varied greatly. Some of the organizational units used a traditional QC approach, while others departed significantly from it. The study also embodied some weaknesses. First, the study was cross-sectional rather than longitudinal. Although we conducted interviews, made observations, and examined archival records in order to gain more depth of perspective than often is afforded by questionnaire research, we collected survey data for the study at only one point in time. Thus, causality cannot

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be established firmly in our analyses. Second, perceived outcomes were measured through the questionnaire, but data on objective outcomes of the participation groups or group programs generally were not available. We suspect, however, that until such time as enough solid case study research has been conducted to permit meta-analysis of the importance of various design characteristics, a study such as the one we conducted is the most practical way to investigate the relative importance of various design factors.

The data provided strong overall support for the model. Contextual integration and group functioning variables were quite strongly related to group and program outcomes. We found support for some but not all of the group design elements in the QC model. We summarized our findings concerning the importance of various design elements in the form of four guidelines (Mohrman & Ledford, 1985). In reviewing them here, we will indicate where others have expressed agreement or disagreement in the literature.

1. Participation groups must include or have access to the necessary skills and knowledge to address problems systematically. This was enhanced by the level of training provided to members, managers, and support personnel and the use of a diversity of outside resource personnel on an as-needed basis, rather than as group members. These findings are consistent with the QC model and the findings of Steel et al. (1985). Level of facilitation was related weakly to success; facilitators were often more important for their role as a communications channel and trainer than for their role as group facilitator. Werther (1982) also argues for the importance of the facilitator role.

2. Formalized procedures enhance the effectiveness of the group. Among the strongest predictors of effective group functioning and contextual integration were number of records kept, number of communication channels,

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and frequent and regularly scheduled meetings. These findings are all consistent with the QC model.

3. The groups should be integrated horizontally and vertically with the rest of the organization. The use of multiple communication channels, use of management-level support groups, and use of a variety of formal recognition award programs were related to contextual integration. Again, these findings are consistent with the QC model, although many QC proponents do not strongly emphasize the formation of management-level support groups. Goldstein (1985), for example, argues against such groups on the grounds that they stifle employee ideas through overcontrol.

4. The groups should be a regular part of the organization rather than special or extra activities. The availability of membership opportunities to all interested employees, the use of intact work groups rather than voluntary special groups, and the use of measurable performance goals by the group all predicted contextual integration and group functioning. This finding contradicts the QC model in a model that is consistent with our critique of the parallel model in general. Interesting, our finding about use of volunteers rather than work groups is consistent with reports about Japanese quality circles by Cole (1979) and Ferris & Wagner (1985). They suggest that U.S. observers have naively believed that membership in Japanese circles is voluntary, when in reality pressure from peers and superiors generates nearly complete work group participation.

Taken together, these conclusions suggest that the QC model includes some desirable elements (training, formalization, facilitation support, recognition, etc.), and some that limit the impact of QCs (for example, use of volunteers and limitation of membership opportunities).

Individual Differences as Moderators of Effectiveness

One issue that has received some attention in the literature is whether there are systematic individual differences between QC participants and nonparticipants. This is an especially important in researching QCs, since QC programs usually rely on volunteers. This means that selection biases are a threat to external validity, especially in cross-sectional studies. That is, differences in outcomes between participants and nonparticipants may be due to individual differences that existed before the intervention rather than to QCs.

At this point, not enough research has been conducted to reach firm conclusions about the ways in which QC volunteers tend to differ systematically from non-volunteers. Several studies have failed to find demographic differences (e.g., Dean, 1985), and Wayne et al. (1986) found no demographic differences between members of more and less effective QCs. However, Hocevar & Mohrman (1985) found that QC volunteers were older and had greater tenure, although there were no differences in education or time in current job. Brockner & Hess (1986) found that for QC members in a computer manufacturing plant, self-esteem was related to performance measured in terms of ability to initiate changes. Dean (1985) found support for a model predicting QC membership in which those who show greater organizational involvement and who believe QCs will be instrumental in making improvements are more likely join. Overall, however, there has been no systematic examination of differences between participants and nonparticipants.

Conclusion

There is evidence that a number of factors within the design and organiational context influence QC effectiveness. However, research on these issues is still at a primitive level. Next we turn our attention outside the organization with a QC program, and examine contingencies for effectiveness that are located in the organizational environment.

Environmental Contingencies and QC Effectiveness

A number of observers have discussed environmental contingencies that they believe influence QC effectiveness. These include contingency factors influencing the use of quality circles; cultural factors affecting the suitability of quality circles for Western societies; and the suitability of QCs for different populations of organizations.

Several factors at the environmental or societal level of analysis have been said to influence the use of quality circles. The most impressive research on this issue has been conducted by Cole (1982, 1985), who conducted a multi-national comparative study of the diffusion of small-group activity (including QCs) over a period of two decades. He found that diffusion depended on three factors: (1) incentives for innovative management practices that are embedded in the condition of the national labor market; (2) the establishment of well funded industrial or national level organizations that are supported by management to communicate methods and to support the change; and (3) the disposition of organized labor toward these changes and its ability to enforce its preferences. Interestingly, none of these factors strongly favored the diffusion of QC-type group programs in the U.S. through the 1970s, although conditions during the 1980s probably have become somewhat more favorable. Cole (1985) argues that these factors are the "forest," while specific implementation and design factors that attract so much attention in the literature are the "trees" that have relatively little explanatory power.

Whether or not quality circles are as suitable to U.S. organizations as to Japanese companies is the source of extensive comment in the literature. Proponents generally suggest that QCs have been a major element of the Japanese economic revival during the past 25 years, implying that they may similarly be a useful tonic for what currently ails American organizations.

On the other hand, a number of observers argue that the uncritical application of this Japanese practice is misguided, for a number of reasons.

First, American national culture may not be as hospitable as Japanese national culture to quality circles. Cole (1979) notes that many Japanese firms with successful, well-established QC programs in Japan do not have such programs in their U.S. subsidiaries, because the Japanese managers doubt that American workers have sufficient commitment to the organization or that American managers are receptive enough to employee suggestions for QCs to work. Ohmae (1982) suggests that the importance of QCs to Japanese success has been overblown in the U.S., and QC success depended on several preconditions that are not necessarily present in U.S. companies. These preconditions include a work force that is well enough educated to use statistical methods and industrial engineering analyses; management willingness to trust workers with cost data and other important information; management willingness to give workers the authority to implement ideas; and worker willingness to cooperate with each other. A similar set of conditions for success in Japan in mentioned by Ishikawa (1968).

Ferris & Wagner (1985) suggest that organizational differences and differences in orientation may make the U.S. a less suitable society for QCs than Japan. They speculate that QCs better fit the orientation of Japanese managers toward work groups, as well as a Japanese management style that Ferris & Wagner characterize as manipulative, paternalistic, and "pseudo-participative;" and QCs better suit the collectivist orientation of Japanese workers as opposed to the individualistic orientation of American workers. Lawler (1986) notes that Japanese organizations use a form of gainsharing that allows employees to share in company performance improvements and thus indirectly rewards them for their suggestions. Japanese organizations also tend to adopt a lifetime employment policy that protects the jobs of workers

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who develop labor saving ideas. Crocker, Charney, & Chiu (1984) outline a wide range of organizational differences between U.S. and Japanese companies, including differences in values, labor-management relations and personnel systems, organizational structure, management style, and decision making practices. Even though they tend to overstate the differences, as Dean (1987) comments in a review, Crocker et al. do believe that QCs can be adapted to fit Western conditions.

Our view is that the differences between Japanese and Western organizations are great enough so that the success of Japanese quality circles says very little about whether the QC approach can be sustained successfully in U.S. companies. QCs are one small part of a rather complex set of management beliefs and practices in Japan. As we have argued, the set of conditions facing U.S. quality circle programs is much less hospitable to their success and long-term survival.

A different environmental issue is whether some types or populations of organizations are more suitable for quality circles than others. As we have noted, QCs are used more in some industries than others; we may add that QCs are used more widely in blue collar manufacturing than in white collar organizations. However, no theoretical rationale has been articulated for the relative suitability of QCs to different types of organizations. QCs now reportedly are used with some degree of success in virtually every type of organization, including government agencies (e.g., Blair, Cohen, & Hurwitz, 1982; Chisolm & Munzenrider, 1985); such unlikely places as police departments (Hocevar & Mohrman, 1984) and the U.S. Department of Defense (Horn, 1982; Bryant & Kerns, 1981, 1982); white collar organizations (McClanahan, 1982; Richards, 1984; Yager, 1980); and service organizations (Ingle & Ingle, 1983 Jenkins & Shimada, 1981) including banks (Wood & Barksdale, 1982; Wood &

Richardson, 1982). QCs also have been used in unionized organizations, although sometimes under different names and with modifications appropriate to a collective bargaining setting (Boylston, 1986; Cole, 1979; Crocker et al., 1984; Guest, 1979; Lazes & Costanza, 1983; Tavernier, 1981). At this point, there is no basis in the literature for claiming that QCs are more effective in some industries than others.

Future Directions

This paper has considered the history of the QC approach, the nature of the QC model, the performance and attitudinal outcomes of QCs, the sustainability of QCs, design options and contingencies relevant to QC effectiveness, and environmental contingencies affecting success. We have been concerned with theory, research, and practice, but we have devoted the bulk of our attention to theory. This reflects our belief that the key weaknesses of quality circle practice and research derive from inadequate theory.

We believe that the quality circle topic is ripe for more and better research. Certainly, there is no shortage of potential research sites for exploring the kinds of issues we have raised in this review. Thousands of QC programs that were established in the early 1980s now are reaching the end of their life cycle. This is the point at which some managers begin to ask thoughtful questions about what they should do next, yet this is the point at which programmed, prepackaged QC programs are no longer helpful. Such conditions can make for the alliance of research and practice to the advantage of both.

We summarize our findings in an unusual form: as a set of specific recommendations about the types of information that should be included in future research reports on quality circles. We are concerned here with we

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factors that prior reseach and theoretical analysis indicate may be responsible for any observed pattern of results in a QC program. These cannot always be controlled for in individual studies. However, following these recommendations will permit research users to assess threats to validity in individual studies and to conduct sounder analyses across studies. Specifically, studies of quality circles should report the following:

1. Design characteristics of QCs. Design characteristics of the QC program should be described, especially with respect to any deviations from the standard QC model. This is essential to future cross-case analyses that attempt to assess the importance of different features of the QC model.

2. Age of the QC program, average age of the circles studied, and life cycle stage of the QC program. Our discussion indicates that the life cycle stage of QC programs and QC groups can have a major impact on attitudes toward QCs and beliefs about their effectiveness. Qualitative description is required to indicate whether the QC process seems to be following a standard life cycle, and to locate the program in the life cycle.

3. Assessment of QC implementation. Ideally, this involves qualitative description and simple descriptive statistics about the implementation process, including mention of whether outside consultants were used, and if so whether they used the standardized QC approach; indication of the percentage of employees in the organization that are currently and were previously participants; and description of suggestion activity, include the rate of suggestion making and examples of key suggestions made by circles, and the fate of these suggestions. This kind of description is needed in order to understand specifically what intervention is being assessed; to say that "quality circles" were studied does not provide enough information.

4. <u>Attitudinal Data</u>. Both attitudinal outcome variables (such as job satisfaction and organizational commitment) and variables more closely linked to the intervention (such as job characteristics, feelings of involvement, and feelings of accomplishment) should be measured. Selection of variables should be guided by theoretical models such as those presented in Figures 1 and 2. Moreover, it is very important to assess attitudes toward the intervention itself; this is necessary to assessing the nature and strength of the intervention. Finally, it is essential to collect attitudinal data from current participants, former participants, and those who have never participated in QCs, since prior studies suggest that there are systematic differences in the attitudes of these groups. Collecting data from nonparticipants is usually easy to do in organizations with QC programs, since typically only a minority of employees are direct participants in QCs.

5. <u>Performance Data</u>. In light of the goals of QCs, no assessment is complete without collection of performance data such as productivity and quality data. Any reports concerning cost savings or cost-benefit ratios should be explicit as to method for calculating savings, benefits, and costs.

6. <u>Year data were collected, environmental conditions facing the organization (e.g., rapid technological change, economic conditions, etc.), type of organization, and nationality of employees</u>. This can permit assessment of important environmental contingencies across studies.

We anticipate that if researchers adhere to these recommendations in future research reports, the potential for accumulation of knowledge across studies will be vastly enhanced.
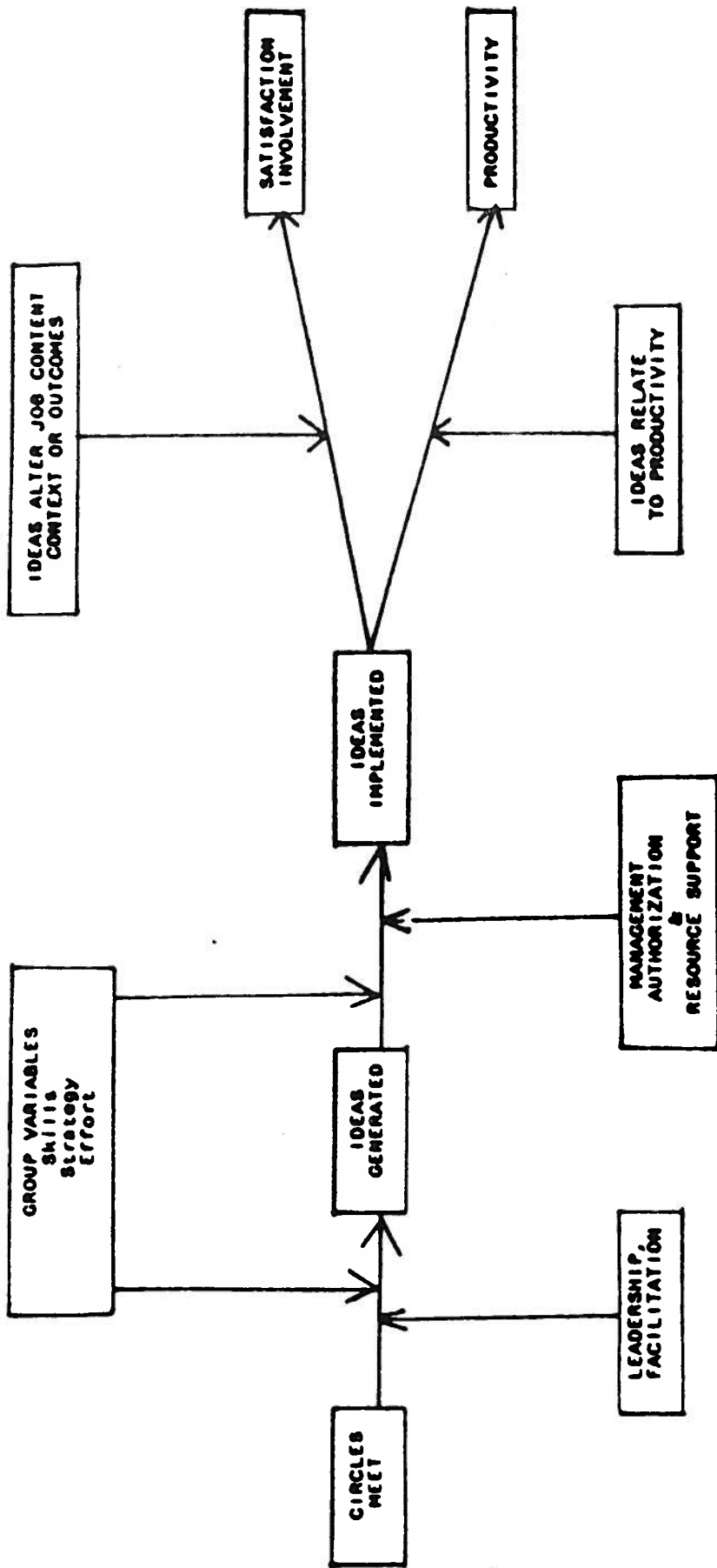
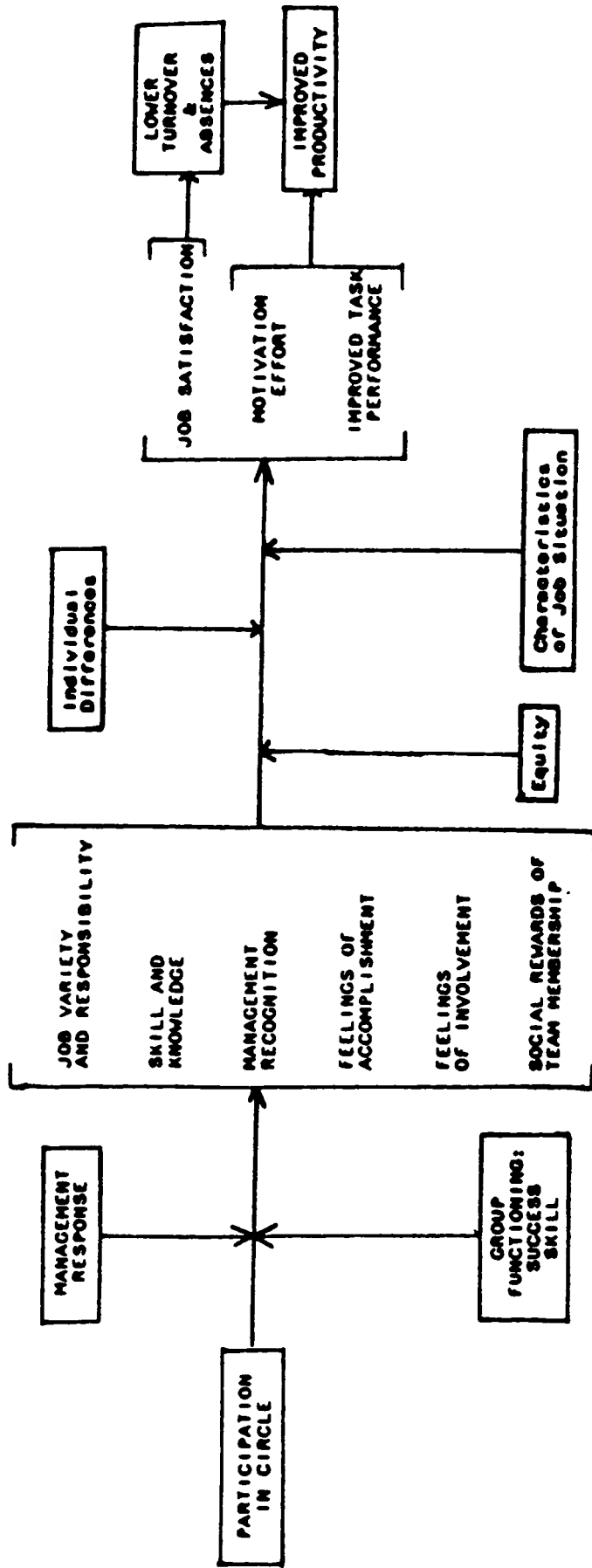FIGURE 1

IDEAS LEAD TO PRODUCTIVITY AND SATISFACTION

FIGURE 2

The Quality Circle Process Results in Productivity and Satisfaction

FIGURE 3

PHASES OF A CIRCLE PROGRAM'S LIFE
(From Lawler & Mohrman, 1985)

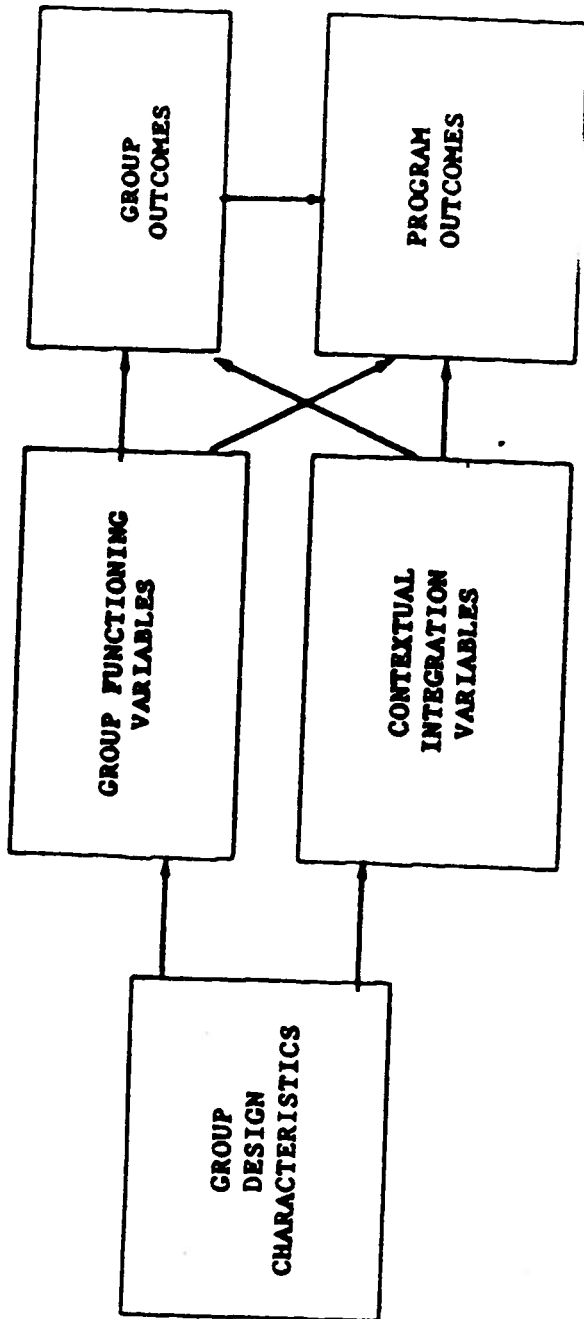| PHASE	ACTIVITY	DESTRUCTIVE FORCES
1. Start-Up	Publicize	Low volunteer rate
	Obtain funds and volunteers	Inadequate funding
	Train	Inability to learn group process and problem solving skills
2. Initial Problem Solving	Identify and solve problems	Disagreement on problems
		Lack of knowledge of operations
3. Approval of initial suggestions	Present and have initial suggestions accepted	Resistance by staff groups and middle management
		Poor presentation and suggestions because of limited knowledge
4. Implementation	Relevant groups act on suggestions	Prohibitive costs
		Resistance by groups that must implement
5. Expansion of problem solving	Form new groups	Member-nonmember conflict
	Old groups continue	Raised aspirations
		Lack of problems
		Expense of parallel organization
		Savings not realized
		Rewards wanted
6. Decline	Fewer groups meet	Cynicism about program
		Burnout

FIGURE 4

GENERAL MODELS OF THE EFFECTS
OF PARTICIPATION GROUP DESIGN

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