

Idea Generation and Productivity: The Promise of CSM

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Although the Crawford slip method is not a widely recognized idea-generation technique, it has demonstrated utility for improving productivity through employee participation.

Productivity is a major concern of all managers. In the public sector, pressures are always present to do more with existing resources or to maintain level of services with fewer resources.

Hayes (1985) contrasted the American "strategic leaps" approach to strategic planning with the Japanese incremental improvements approach. Progress through strategic leaps requires intensive involvement by high-level management and numerous staff specialists. It is a top-down, highly visible, and usually expensive approach that requires little or no input from the employees at lower organizational tiers. The incremental improvements approach, on the other hand, assumes progress comes through many small steps, few of which are highly visible or necessarily expensive. It is a bottom-up orientation that encourages and supports employees at the lowest levels in identifying improvements to enhance organizational effectiveness and efficiency. In companies using an incremental improvements approach, managers expect "improvements to bubble up, in an entrepreneurial fashion, from lower levels in the organization" (Hayes, 1985, p. 116).

The incremental approach to strategic planning emphasizes the importance of the employees in productivity improvement. Halachmi and Holzer (1986) identified an "employee's involvement in identifying means and developing plans to improve productivity or its meaningful measurement" (p. 12) as a strategic issue in public-sector productivity. They

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suggested that genuine employee involvement is essential to effective system change. One example of organizations recognizing the potential contributions of employees in productivity improvement is the growth of quality circles (see Mento and Steel, 1985; Roll and Roll, 1983).

This paper discusses a productivity improvement method that is founded on the premise that employees at all levels have useful ideas to offer management. The Crawford slip method, developed by C. C. Crawford of the University of Southern California, provides a systematic method for obtaining ideas from employees and converting these ideas into products that can be used by management. Although the Crawford slip method (CSM) is not widely known, applications of CSM have produced over 200 articles, twenty-one books, and numerous reports to management (Krone, 1987b). Its utility for productivity improvement has been amply demonstrated, especially in the public sector.

We will begin by discussing the Crawford slip method within the context of a larger field—organizational development. This will provide a foundation for understanding CSM as a productivity improvement method. Next the Crawford slip method will be described and the steps explained. Advantages and disadvantages of CSM will be noted. Finally, uses of CSM to improve productivity will be discussed, followed by specific examples of actual public sector applications.

Organizational Development

Organizational development (OD) may be defined as “the planned use of interventions based on behavioral science knowledge, aimed at encouraging organizational self-examination and acceptance of changes that will improve organizational effectiveness and health” (Saal and Knight, 1988, p. 465). The thrust of OD is to help organizations to help themselves. OD views organizations as open systems existing in interface with multiple subsystems (for example, social-psychological, structural, technological, and so on) and in interface with the environment. Interventions focus on solving problems among subsystems that through interdependence impact other subsystems. OD efforts typically begin with interventions in social-psychological and structural subsystems (French and Bell, 1978). Internal or external consultants diagnose problems and conduct programmatic activities designed to facilitate organizational functioning.

The effectiveness of OD interventions in general has been debated. Porras and Berg (1978) reviewed thirty-five OD studies and concluded that the field was “embryonic” and needed systematic research to determine its efficacy. Conversely, Golembiewski, Proehl, and Sink (1981) evaluated the results of 270 public-sector OD interventions and found over 80 percent of the studies produced positive or highly positive effects on organizational subsystems.

For the administrator and the consultant, evaluations of the effectiveness of various intervention methods are probably of greater interest than overall evaluations of OD per se. French and Bell (1978) reviewed several types of OD interventions, one of which is survey-feedback activities. The potential of survey-feedback to effect change and improve organizational functioning is well established. Nadler (1980, p. 73) concludes that "information in general and feedback in particular can have significant and profound effects on the behavior of individuals, groups, and the adaptability of systems." Nadler suggests the effectiveness of information feedback in organizations depends on (1) the process by which data collection and feedback procedures are planned, (2) "the nature of the data," and (3) feedback process characteristics. One possible outcome of survey-feedback activities is the identification of discrepancies between the existing state of the system (or subsystems) and the desired state. These discrepancies can be motivators for improvement and change (Lloyd, 1977).

A major determinant of the effectiveness of survey-feedback activities is the level of involvement by employees and supervisors. The greater the involvement of organizational members in the process (from planning through follow-up), the greater will be the potential for change and improvement (Nadler, 1980). Employee involvement can lead to positive changes in employee attitudes and acceptance of changes. Managers' involvement facilitates openness to recognition of organizational problems and the need for change.

Considered from the perspective of organizational development, the Crawford slip method is conceptually similar to OD survey-feedback methodologies. Both CSM and survey-feedback activities place high value on the employee's participation and the employee's input. An underlying premise for both methodologies is that information obtained from employees can be used to effect positive change and improve productivity. Krone (1987b) has, in fact, referred to CSM as a type of group survey (in contrast to Crawford and others who have usually referred to CSM as a "think tank technology," analogous to Delphi and nominal group techniques). Procedurally, CSM overcomes some of the counterproductive effects (suspicion, "why are they asking me this?") sometimes attributed to survey-feedback methods (see Nicholas, 1982). Within the typology of organizational development theory proposed by Porras and Robertson (1987), CSM can be viewed as a procedures theory within implementation theory.

The Crawford Slip Method

C. C. Crawford originated the Crawford slip method in 1925. Over the next fifty years, he applied the method in hundreds of situations to resolve problems and improve productivity in both the public and private sectors.

Of his many publications during this period, *How to Make Training Surveys* (Crawford, 1954) is probably the most representative of his thought.

Interest in CSM was rekindled in 1979 by John Demidovich, professor of management at the Air Force Institute of Technology and frequent speaker and consultant to organizations both in and outside the Department of Defense. Introduced to Crawford by Charles H. Clark (1958), author of *Brainstorming*, Demidovich assisted Crawford in an active return to consulting activities and collaborated with Crawford on numerous projects over the next six years. At the University of Southern California, Crawford's resumption of professional activities after a brief retirement resulted in the formation of an informal group of faculty members interested in furthering productivity through the Crawford slip method. In December 1984, USC formally established the USC Productivity Network within the School of Public Administration specifically to advance research, consulting, and teaching based on CSM. For a bibliography of articles and papers about the method or based on the method between 1981 and 1987, see Krone (1987a).

The Crawford slip method is a system for (1) obtaining written information, ideas, suggestions from individuals in a group setting; (2) analyzing and synthesizing the data gathered; and (3) reporting the results. The method provides a means whereby a manager or consultant can gather a large amount of information in a very short period of time (typically, less than an hour). Because CSM is based on anonymous and independent inputs, it can provide qualitatively different data than that normally obtained in a group setting using other idea-generation techniques. Used properly, it can provide deep penetration into problem areas, creative ideas for problem resolution, high-quality data for decision making, and ideas for productivity enhancement and organizational improvement. Comparing CSM with quality circles, Delphi, and other idea-generation techniques, Rusk and Krone (1984, p. 251) concluded that CSM was "the finest qualitative systems analysis tool on the market."

Publications about CSM or based on CSM-generated data contain various descriptions of the method. The most definitive writings about CSM are two monographs, *Crawford Slip Method: How to Mobilize Brainpower by Think Tank Technology* (Crawford and Demidovich, 1983) and *Productivity Improvement by the Crawford Slip Method* (Crawford, Demidovich, and Krone, 1984). Of the other publications that detail CSM in an abbreviated form, Krone (1987b) is especially noteworthy.

Crawford (1983, p. 187) describes the essence of CSM as follows: "Assemble the relevant people; define the target subjects; get everyone to write their ideas—one idea at a time, in a single sentence, on individual slips of paper; collect and classify all slips; edit the results into final form." Stated thusly, CSM can look deceptively simple. However, like

any OD or productivity-enhancement activity, it requires study and repeated practice for the consultant or manager to efficiently achieve maximum results. The basic stages in applying CSM will now be reviewed using the general framework of Nadler's (1980) data collection—his feedback model.

Preparing to Collect Data. The first step in preparing to use CSM is to ensure an understanding of the objective of the data collection. Why are you going to use CSM? What kind of information, input, and so on do you seek? How might the results be used? The answers to these questions will help determine (1) who needs to participate in the slip-writing sessions (all employees, subject-matter experts, or only supervisors) and (2) the nature and wording of the target questions (the specific questions to be addressed in the sessions).

The answers will also aid decisions about administration and analysis, for example, should CSM be done by in-house personnel or is an outside consultant needed? Who will conduct the data collection sessions? Who will analyze the results? Many factors can affect these decisions (scope of the study, availability of training resources, sensitivity of the information).

Finally, planning is not complete unless thought is given to the receipt and distribution of CSM-generated products. What type of product is expected (written report, oral presentation, all the results, synopsis of the results)? For whom is the product intended (the person who requested the study, key personnel, all employees)? In organizational productivity-enhancement applications of CSM, feedback to employees can be a key ingredient. The promise of feedback can facilitate the quality of slip writing. Actual feedback can be instrumental, directly and indirectly, in productivity improvement. In some organizational situations, several products may be required, for example, a report to management and a perhaps less sensitive report to employees.

Collecting Data. The slip writing occurs in group sessions or workshops. The CSM literature describes workshops with as few as four to ten people and with as many as a hundred. Krone (1987b) suggests twenty to thirty as a group-size guideline. Workshop composition, availability of people, and space requirements may be constraining factors. Similarly, the abilities or preferences of the facilitator who leads the workshop will be a factor. Some people can motivate an audience of hundreds with ease, while others work best in small groups.

The workshop begins with an orientation to CSM, partly descriptive and partly motivational. Examples of the effective use of CSM are appropriate. The intent is to create an atmosphere in which people realize that this is their opportunity to express their thoughts and ideas, independently and anonymously, without recrimination. A good example of an orientation to a CSM workshop can be found in Krone (1987b, p. 324), as follows:

- The greatest untapped resource for managers, engineers, scientists, and leaders in industry, the government, and the military is the brainpower of their own people.
- The Crawford slip method is the best group survey method available for harnessing people's brainpower and putting it to productive work.
- The CSM has been helping managers and leaders improve performance and productivity across a wide spectrum of activities for six decades and has been in a renaissance since 1981.
- Individually we are agents for innovation in our respective fields.
- Collectively we possess a treasure of know-how about operational knowledge.

After the descriptive-motivational phase of the orientation, the facilitator provides the guidelines for slip writing. Crawford and Demidovich (1983) recommend small slips (2 $\frac{3}{4}$ " \times 4 $\frac{1}{4}$ ") of paper, which can easily be prepared from 8 $\frac{1}{2}$ " \times 11" sheets of paper. Each participant will have a stack of these slips, and ample slips should be available should more be needed. Participants are instructed to write only one thought, idea, or response for each slip and to write it across the top of a slip. Each participant writes as many slips as he or she desires to each question. It is also important that participants be freed from any concern that someone will try to identify them through their handwriting. One means of ensuring this is through use of an outside consultant. Other means found in the CSM literature include (1) employee (participant) groups to analyze slips and report results to management and (2) transcription (typing) of slips. In-house consultants should emphasize that management does not see the actual slips, just results and transcribed examples.

During slip writing, there is no discussion. Each person works independently. In a one-hour workshop, the orientation may take ten to fifteen minutes. This could then be followed by slip writing to three target questions for fifteen minutes each or four target questions for ten minutes each.

The actual collection of data occurs by individuals writing their ideas, suggestions, and thoughts on slips of paper in response to a target question. The question should be made visible so participants can read it and think about it. Creating good target questions is one key to effective CSM. During the planning phase, numerous questions should be created and examined to produce the most appropriate questions for the study objectives. Target question 1 should be a question that not only provides useful data but also is relatively easy to answer. Once the group gets into the slip-writing mode, the session will build of its own momentum. The following is an example of an initial question: "If we could do one thing to help you do your job better, what would it be?" Questions can focus on problem areas, ideas on how to solve problems, identification of where

changes are needed, identification of areas where no changes are needed, and so forth. Specific questions will depend on the group and the objectives. In general, the CSM literature suggests that people average about one slip per minute, with saturation reached at about 10 slips. Of course, some individuals will produce more; others, less.

When most participants have completed their writing to target question 1, given a short notice to finish and then call time, collect the slips to the first question, and present target question 2. When slip writing has been completed for each of the target questions, thank the participants for their involvement and ideas. In an organizational CSM workshop, giving the participants some idea of when feedback will be provided is appropriate.

Analyzing Data. The most difficult phase of CSM now begins. CSM data analysis is categorization. Workshop sessions can produce large numbers of slips. For example, one session of twenty people writing to three target questions should produce over 500 slips. The analyst must read each slip and assign it to some category. This process will generate many categories and result in many small stacks of slips.

Once the initial sort is completed, the analyst must look across categories and organize the data further. Some categories may be subdivided. Typically, though, larger categories will be created with former categories as subdivisions. The end result of this process is that the data is organized into a logical, coherent data base. The organized data provide the basis for CSM products.

The organization of the slips into a useful data base can be demanding of time and energy. CSM is very efficient in obtaining input from session participants in a short amount of time, but it requires considerable work by the analyst during this phase. Sorting the slips requires space, such as a very large table, so the analyst can see the various categories. Furthermore, for some people, sorting is a fun, pleasurable activity; for others, it is tedious and tiring. Individual differences exist not only in the enjoyment of the process but also in aptitudes for effective sorting. Training and experience in categorization of slips is very important. For the novice to CSM, it is good advice to first try CSM in small sessions and address issues that are not critical to career or organization. Once experience is acquired, more important applications of CSM can be made.

Given the amount of work required to categorize slips, one might question the utility of CSM. Experience with CSM answers that question. CSM produces a wealth of ideas, suggestions, and information greater than any other system—and it does so in a very short data-collection period. Used in organizations to obtain ideas for productivity improvement or problem resolution, CSM validates the proposition that many employees have good, useful ideas that somehow, for whatever reasons, rarely surface to the level of management review and potential action.

While management may determine that some slip-generated ideas are of marginal utility, management will typically find that other ideas provide valuable insights and solid recommendations.

Feeding Back Data. The initial planning for CSM should have determined the products to be generated. The organized data base provides the content for these products. Specific contents of a product will depend on for whom the product is prepared. For example, in a feedback to a senior manager, some sensitive comments may be best provided orally and confidentially, while the report to senior management itself focuses on substantive issues. The same study might also generate an abbreviated report to feed back major findings to employees.

CSM is foremost a systematic feedback mechanism. In organizational studies, CSM-generated products simply communicate employee ideas and thoughts to management. The analyst organizes, groups ideas, and edits wording as appropriate but does not evaluate. CSM gives managers information they can then evaluate as to usefulness and merit and use in decision making. The distinctive quality of this information is that it comes from those people who know the organization best—the employees—and that it comes from each employee anonymously and independently. CSM gives managers feedback they would not otherwise receive. Regardless of whether a manager's style is participatory or autocratic, CSM can contribute to quality decision making.

Of writings on CSM, feeding back data has been discussed the least. Crawford and Demidovich (1983, pp. 22-25) provide the most complete discussion. Conceptualizing CSM as an OD survey-feedback activity requires attention be given more fully to employee feedback and recognition of the role such feedback plays in productivity enhancement.

Following Up. Nadler (1980) describes this stage as building on organizational feedback to facilitate desired changes. The CSM literature addresses this stage only indirectly. It is apparent across writings that CSM is viewed as a system that can be repeatedly applied to an organization to continue organizational improvement. For example, a problem-diagnostic workshop may produce problem identifications or even tentative solutions that could be addressed by subsequent CSM workshops targeted specifically to given problems. Crawford and his associates suggest that subsequent workshops can increase specificity and usefulness of data if the original workshops were effectively conducted. They also suggest that a large number of new target questions may favor use of rotation workshop procedures, where participants begin their slip writing on different target questions (Crawford and Demidovich, 1983; Crawford, Demidovich, and Krone, 1984). In these rotation workshops, a participant writes a predetermined number of slips to each question (for example, ten) and then moves on to the next question. Thus this procedure more efficiently uses participant's time. Whether there are significant quantita-

tive or qualitative differences in the results from rotation workshops and the standard CSM workshops is not apparent from the CSM literature.

Applications of the Crawford Slip Method

Most documented applications of CSM have come from Crawford and his associates. Unlike some productivity-enhancement methods, CSM has never been the subject of a major book or publicity effort. The principal CSM monographs are not even copyrighted. Word of CSM has spread mainly through articles in nonrefereed or trade publications (such as *Armed Forces Comptroller*, *Journal of Dental Practice and Administration*, *The Bureaucrat*, *Logistics Spectrum*), through presentations at the meetings of regional and national associations, and by word of mouth. The result is that CSM has remained relatively unknown by administrators, managers, consultants, and other professionals who might apply CSM to the benefit of organizations.

Crawford and his associates, however, have not had a monopoly on CSM applications. People exposed to the method, or who have learned about the method through writings or from other people, have used CSM, sometimes after training by Crawford, sometimes not. The degree to which undocumented applications of CSM have enhanced organizational or personal productivity can only be speculated on. Within the federal government, we have encountered managers, staff, and internal consultants who have used CSM effectively but who have not benefited from specific CSM training. We have seen managers using CSM within organizations to identify issues needing attention and areas that should be left alone. We have seen staff officials assigned to projects who responded with CSM workshops composed of subject-matter experts and/or officials from other functions. We have seen educators using CSM in the classroom to get instructor feedback and to improve curricula. These observations, plus the documented uses, underscore the potential of CSM applications to improve organizational productivity.

The objective of CSM applications are varied. Major uses have been to improve training, improve operations, and facilitate planning. Regardless, the general thrust of CSM is toward enhancing productivity through idea generation. The degree to which CSM actually results in productivity improvements depends on several factors. Three key factors would appear to be (1) the effectiveness of the CSM administration and analyses (the quality of the data and analyses), (2) the degree to which management uses the data to effect change, and (3) the degree and nature of feedback to the organization. An optimal situation for using CSM would be a situation in which (1) management initiates the idea for CSM workshops, (2) an outside consultant skilled in CSM is used or management allows for the training and gradual development (through less mission-essential workshops) of an

in-house consultant, (3) management sincerely desires information to facilitate decision making and change, and (4) management effectively communicates its desire to obtain anonymous and independent inputs from employees. While this level of management commitment would greatly increase the potential benefits of CSM application, this level is not essential for organization to drive benefit from CSM.

Under the heading "Some Success Stories (Some More Successful Than Others)," Crawford and Demidovich, (1983, pp. 48-55) provide thirty-six "snapshots" of CSM applications. The following example is of a manufacturer of heavy industrial equipment:

[The manufacturer] needed a new sealant for attaching cylinder heads. Twenty multidisciplinary people wrote hundreds of slips to define, design, or plan that sealant. After writing warm-up slips on six targets, they cross-fertilized in groups of three. Then they all compared, consolidated, agreed, and made a recommendation to management. Since management was in the 20, action was prompt. The new sealant was in production within days. Since all disciplines were involved, all were committed to its success [p. 49].

In another example, a police sergeant and a professor teamed up to use CSM to improve police operations in a major city:

They got slips from police on what they needed to be taught HOW TO DO in police work. Examples were: a) How to broadcast for help while chasing a fleeing car. b) How to check pickpockets in a crowd. Soon 4,000 police personnel were getting the fifteen-minute "lessons of the day" when they reported for work. The program went on for years [p. 52].

The examples provided by Crawford and Demidovich show the diverse settings and the variety of ways in which CSM can be applied. We will now discuss several ways in which CSM has been applied to improve productivity in the public sector within the Department of Defense.

Some of the earliest applications of CSM were to develop instructional material for training. Crawford's organizational consulting convinced him that inadequate job and task knowledge limit performance and hence productivity. America's ability to maximally utilize technology has fallen behind the development of technology. With time on the job, employees expand their job knowledge and can work more efficiently and effectively. Unfortunately, this knowledge acquired on the job is lost due to turnover and job rotation. One way to increase productivity is to record this knowledge before it is lost, thus reducing on-the-job training time for those that follow. Also, the recording of procedures and job

knowledge has the additional benefit of identifying areas where improvements can be achieved. It may be that in accordance with Pareto's law, only a small portion of the tasks are causing most of the problems. Consequently, significant improvements to productivity may be achieved through application of CSM to these more troublesome tasks.

In 1979 Demidovich conducted a diagnostic CSM workshop for an Air Force major command. Participants were thirty-eight contracting officers from bases throughout the United States. The diagnostic workshop results, analyzed by Crawford, indicated the need for better training. New employees in contracting positions needed better guidance on how to accomplish tasks. Crawford recommended a follow-up workshop to develop a training manual.

In 1980 Demidovich and Crawford conducted a follow-up workshop. From bases throughout the command, ninety contracting officers were chosen to participate in writing a procedures manual. Leading CSM workshops focusing on previously identified areas, Crawford and Demidovich (Tactical Air Command, 1981) produced in five days procedures for over 200 contracting tasks. The result was *Contracting Procedures Guide: Step-by-Step Directions for Contracting Tasks*, a seventy-four-page document produced in minimal time and so useful it was adopted by three other major commands.

In conducting workshops at conferences, Demidovich often would use CSM to get ideas from participants on how to improve their profession (Crawford, Siegal, and Demidovich, 1985) or how to resolve a particular problem (Crawford and Demidovich, 1983). The scope of CSM improvement-oriented workshops can thus be very general or very narrow. In consulting in government organizations, we have found CSM provides data otherwise difficult to obtain. In a study of a government agency in the midwestern United States, we collected over 1,300 slips from seventy employees in an organization experiencing high turnover. The anonymous, independent comments identified specific problem areas not identified by a previously administered attitudinal survey. The resultant feedback to senior management enabled them to act to make changes. Moreover, feedback to us indicated that management acting in response to employee concerns positively affected the work environment of the unit.

The use of CSM to facilitate planning has been well illustrated at a DOD educational institution. At the request of a member of the administrative staff, Demidovich conducted a workshop for key officials. It should be noted that the head of the institution agreed to the CSM workshop somewhat reluctantly, as he saw little to be gained by this activity. The head of the institution permitted the workshop mainly to placate the administrative staffer, who saw potential merit in CSM. When the head of the institution received the report generated by the CSM work-

shop, he was favorably impressed by the results of CSM and requested a large-scale CSM initiative. The quality of the ideas generated convinced him of CSM's usefulness. In several CSM workshops, faculty and staff generated slips targeted to identifying ways to improve the institution and the accomplishment of its mission. The slips were then analyzed by in-house resources being used as internal consultants. The analysis resulted in major categories and subcategories indicating problems and potential improvements. To address the issues identified by CSM, the head of the institution formed a committee for each category. These category committees reviewed the CSM generated input and formulated recommendations to management. These recommendations were then provided to the executive leadership of the institution. Executive leadership evaluated the recommendations and used them as a basis for development of a five-year improvement plan. Six months after plan development, CSM sessions were again conducted with faculty and staff to obtain employees' input on the plan and the process. At this institution, CSM was a very effective OD system for organizational self-renewal.

Conclusion

The potential of CSM as a system to improve productivity through idea generation has been amply demonstrated. However, the potential of CSM to improve productivity, particularly public-sector productivity, is largely undeveloped. Administrators cannot apply and adapt a method of which they are not aware. Similarly, program evaluators cannot quantify the results and evaluate a method unless it is used.

CSM offers a flexible system for productivity enhancement. Its utility has been demonstrated in both public and private sectors. It can be applied by a manager routinely in a staff meeting. It can be applied by a consultant in a large-scale OD intervention. It is well founded on employee involvement and the importance of feedback in organizational change. A relatively unknown system, CSM warrants a position among those techniques available to administrators and consultants.

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