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An MCDM Approach for Resolving Goal Conflict in MBO

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Management by objectives tends to focus on one goal or objective at a time or on goals that can be made consistent. Little attention in either literature or practice is given to goals that are to be achieved simultaneously, yet conflict. Recent work in multiple-criteria decision making (MCDM) can help in the formulation of goal-conflict decisions in MBO contexts. Techniques for resolving conflicts between persons can be incorporated in an MCDM framework that explicates conflict among simultaneous goals and reveals value conflicts between managers and subordinates.

Management by objectives (MBO) has been variously called a system, a concept, an approach, a process, a program, a philosophy, and a way of life. Briefly, MBO is a means for coordinating decentralized self-controlled actions of managers to achieve the overall goals and objectives (these terms are used synonymously) of an organization. Reports [Carroll & Tossi, 1973; McConkie, 1979; Odiorne, 1974; Raia, 1974] indicate that MBO, since its gestation over twenty-five years ago [Drucker, 1954], has been used in some form by most large corporations and governmental organizations.

The essence of management by objectives is decisions at every organizational level: decisions on objectives, on actions to achieve them, and subsequently, decisions on results obtained and on the performance of individual managers. Briefly, the steps in MBO, as adapted from Raia [1974], are:

1. At each organizational level, every manager confers and negotiates with each subordinate manager to agree on organizational and personal development objectives for the subordinate for a specified period of time; usually a year.
2. The subordinate prepares action plans (which may be reviewed by the manager), then implements them, attempting to achieve the agreed-on objectives.
3. At the end of the specified period, the manager and the subordinate review progress toward achievement of the objectives, at which time performance appraisal is made. Reviews may also occur at check points within the period.
4. The cycle is repeated for the next time period.

Objectives start at the highest level and cascade downward throughout the organization. The idea is that lower-level objectives, when achieved, will contribute to higher-level objectives, and that the upward summation of achievement will equal achievement at the highest level of the overall goals of the organization. Implicit in this idea are certain assumptions:

1. The organization may have more than one objective.
2. Each managerial level may have more than one objective.
3. A hierarchy of objectives can be specified so that each subobjective contributes to the next higher objective.
4. There may be more than one subobjective for each higher objective. (There is a parallel here with the concept of "unity of command" as an organizing principle: each subordinate reports to only one superior, who may have more than one subordinate.)
5. The upward cascading of achievement of multiple objectives at every level makes possible the achievement of the several objectives of the overall organization.
6. Organizational strategy is the pattern of objectives and means for achieving them in hierarchical chains of ends and means, but this strategy evolves through the MBO process and not by any central planning.

Inherent in these underlying assumptions is the overriding idea of consistency of objectives — i.e., objectives are fulfilled as means for achieving next higher objectives, and at any one level objectives are nonconflicting. Upward consistency ranks first

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along with specificity and measurability in the goal-setting process, according to McConkie [1979], who surveyed the writings of 39 MBO experts. He found the prescriptions for the goal-setting process (ranked by percentage of experts in agreement) shown in Table 1.

Table 1
The Goal-Setting Process as Seen by Leading MBO Authorities[a]

Goals should be:	Agreement
1. specific	97%
2. defined in terms of measurable results	97%
3. linked to overall organizational goals	97%
4. reviewed periodically	82%
5. accomplished in a specified time period	71%
6. quantifiable, or at least verifiable	68%
7. flexible, changeable as conditions warrant	68%
8. include a plan of action for accomplishing the results	55%
9. assigned priorities or weights	50%

[a] McConkie, M.L. A clarification of the goal-setting and appraisal processes in MBO. *Academy of Management Review*, 1979, 4(1), 29-40.

Last on McConkie's list, with only half the experts agreeing, is the prescription that goals and objectives should be assigned priorities or weights. That is, barely making the list in this survey of the MBO literature is this suggestion that goals and objectives may not be achievable at all (otherwise no need for priority assignments) or that goals and objectives may conflict one with another (otherwise no need for weight assignments).

Priorities for a set of objectives indicate which ones the manager will apply time and energy to first, second, third, and so on. Weights for objectives as used in the MBO literature indicate how much of a manager's total resources will be applied to each objective. Little in the MBO literature tells managers what specifically to do with their priorities and weights, once established during the goal-setting process. For example, Raia [1974] suggests that objectives be ranked for priority or classified as critical, necessary, or desirable. Alternately, objectives may be assigned weights of relative importance. Raia's weight example uses percentages that add to 100 and are to be applied to resource allocation. But no advice on making time and resource decisions using these priorities or weights follow these suggestions.

There are recommendations that priorities and weights should be considered at end-of-period performance review time, but there is little in the MBO literature, or apparently in the actual implementations of MBO in organizations, that helps managers before performance reviews in choosing the action plans to achieve the objectives, once they are decided on. This, of course, is the problem addressed by the literature on decision making.

Decisions in the MBO Process

As mentioned above, the essence of MBO is decisions — decisions on objectives, on actions to achieve them, and, subsequently, on results and performance. We have seen that the process of choosing objectives is highly decentralized in an MBO system, once the decision to implement MBO has been made. The choice of action plans to achieve agreed-on objectives is straightforward managerial decision making. Nowhere in the MBO literature do we see discussed the generation of alternative action plans and the evaluation thereof before selection. Finally, performance appraisal decisions, and hence managerial reward decisions, are reported in the literature to require attention to uncontrollables, contingencies, and changed conditions *after the fact*, yet no acknowledgement of these basic ingredients of decision making *before the act* at goal-setting and action-plan time is seen. As we shall see later, the most difficult decisions are those to be made when objectives conflict one with another, when compromise and tradeoff among objectives is the stuff of hard decisions.

To illustrate conflict among objectives, let us look at an example from a longtime proponent of MBO. Odiorne, in discussing the dangers of quantifying objectives, tells this story:

> Take the case of the firm that [decided] to initiate [an MBO] program. The managers and staff participated enthusiastically. In addition to . . . objectives for the control of financial, sales, and manufacturing figures, they also added a number of highly innovative and invaluable programs dealing with improved public relations, employee relations, and product and customer service. At the end of the year, the results were reviewed by the top management officials. When the rewards and citations for

achievement were issued, it became very clear that only those goals which had measurable outcomes were being recognized. Among those which had been left unrecognized was a complete turnaround of the community's attitude from hostile to friendly and supportive. A general decline in employee hostility was another salutary but unrecognized outcome.

Furthermore, everyone knew that the manager who had come off best in the MBO results sweepstakes had actually done the company considerable damage by the way in which he had obtained the splendid numerical results in his plant. For one thing, he had badly injured labor relations by breaking faith with union officers during the year. Each of these labor leaders made known his intent to "get even" with the company for betrayals at the hands of this manager. A second negative accomplishment which did not appear on the numerical results table worshipped so ardently by top management was the destruction of the careers of two promising young men who had been in his baleful area of influence. Both had been forced from the company for no other offense than that they were sufficiently competent to threaten the manager's own progress. Still another devastating result which did not appear on any account book was his practice with regard to maintenance of the equipment under his control. By cutting necessary repairs during the year, he had shown impressive "savings." Needless to say, the costs in downtime and poor quality in following years exceeded by far what he had "saved." [1974, pp. 123-124]

Examples of conflict among objectives in managerial decision making such as this appear frequently in incidents and cases used for teaching. A manager may have to sacrifice efficiency to comply with equal opportunity employment practices or sacrifice departmental profits to meet the social objectives of the company [Steiner & Miner, 1977]. These are objectives to be achieved simultaneously. Recently in the decision analysis literature, increased attention has been given to decisions involving conflict among simultaneous objectives. This subset of the literature is called multiple-criteria decision making (MCDM).

Simultaneous Multiple Objectives

An organization guided by MBO is simultaneously achieving throughout the organization multiple objectives that should add up to the achievement of overall goals. However, the organization is not a single decision maker. MBO strives to decentralize decision making. The decision makers are individual managers at every level, or decision groups whose members conceptually can view their decision situations as if their group were a single decision maker. In this context, the ingredients of decision making are: objectives, criteria for predicting or assessing achievement, alternative courses of action, evaluations of these alternatives using the criteria, and choices of programs of action to achieve the objectives. (Implementation, follow-up, and control are omitted here on the grounds that they follow the "decision.")

Given an objective, its criterion, and alternative courses of action discovered or created by the manager, and given an evaluation of the efficiency or effectiveness of each alternative course of action for achieving that objective, the decision as to which alternative to choose for implementation becomes obvious: simply choose that alternative which scores best on the criterion. This is single-criterion decision making.

If the achievement of all objectives were completely independent, and if the choice of the action to best achieve each objective involved no interactions such as resource constraints or side consequences, and if objectives were hierarchically consistent, then action planning for multiple organizational objectives would simply need single-criterion decision making by each manager.

However, interdependency among the outcomes of actions to achieve several objectives means that consideration and evaluation of an alternative involves assessing its effect, if implemented, on more than one objective. The literature of multiple-criteria decision making (MCDM) specifically addresses conflict among simultaneous objectives [Bell, Keeney, & Raiffa, 1977; Easton, 1973; Fishburn, 1964; Keeney & Raiffa, 1976; Starr & Zeleny, 1977; Zeleny, in press]. The ingredients of a multiple-criteria decision situation are:

1. Two or more goals or objectives ($O_1, O_2, \ldots O_n$).
2. Criteria by which achievement of each objective can be predicted and later assessed ($C_1, C_2, \ldots C_n$).
3. Alternative courses of action that affect two or more of the objectives ($A_1, A_2, \ldots A_m$; prefixed by a T when tentative — e.g., TA_1).
4. Evaluations of the efficiency or effectiveness of each alternative for each objective in terms of its criterion (E_{ij}; $i = 1, 2, \ldots m$; $j = 1, 2, \ldots n$; prefixed by an S when scaled to represent utilities — i.e., SE_{ij}).

5. A value, weight, or notion of relative importance of each objective ($V_1, V_2, \ldots V_n$).
6. A ranking of the alternatives relative to their overall efficiency or effectiveness for all objectives ($R_1, R_2, \ldots R_m$), which may be based on some overall scheme, yielding scores ($S_1, S_2, \ldots S_m$).

As will be shown, except in the fortunate circumstance when there is a single dominant alternative, the choice of any one alternative trades off the achievement of one objective for the achievement of another. The essence of this decision situation is the necessity for simultaneous achievement of goals. This can be illustrated by an example, shown in Table 2, adapted from a classic business policy case about implementation of Texas Instruments' profit center system [Christensen, Andrews, & Bower, 1978] in which a department head has imposed on him current annual profit targets above his own benchmark estimates, but must also consider future annual revenues.

The example in Table 2 illustrates multiple-criteria decision-making concepts. Alternative 1 is the status quo; this means carrying on present policies and actions, doing nothing differently. Given predicted environmental factors, the status quo will provide an estimated benchmark profit level and an estimated benchmark revenue as the evaluations for each objective. Alternative 2, promote free favorable publicity — the evaluations for which are rather unlikely — would increase both current profits and future revenues above the benchmark level. Alternative 3, increase advertising, would, assuming a lag in effectiveness of advertising, decrease current profits while increasing future revenues. Alternative 4, decrease advertising, would immediately increase profits, owing to expense reduction and, after a while, would decrease revenues below benchmark. Alternative 5, switch advertising dollars to entertainment (of current and prospective customers), is predicted to decrease benchmark performance for both objectives. Of course, "benchmark," "above," and "below" are crude evaluations and would be greatly refined for an actual decision analysis. Here, it is sufficient to show only directional changes in the predictions used as evaluations.

Evaluations for Alternative 2 are better for both objectives than any other alternative. In MCDM terms, Alternative 2 dominates all other alternatives. Considering only the evaluations shown in Table 2, the choice is obvious: Alternative 2. It dominates on both criteria.

However, Alternative 2 is quite unlikely to bring about the consequences shown. Any consideration of this low probability would quickly eliminate Alternative 2. With Alternative 2 gone, the choice is not so obvious. There remains no dominating alternative. However, Alternative 5 is now dominated by Alternatives 1, 3, and 4, so it may be eliminated

Table 2
A Multiple-Criteria Decision-Making Situation

Values:	V_1: —?—	V_2: —?—		
Objectives:	O_1: Profit	O_2: Growth		
Criteria:	C_1: Current Annual Department Profit	C_2: Future Annual Department Revenues	Score	Rank
Alternatives:	Evaluations:	Evaluations:		
A_1: Status quo	E_{11}: Benchmark estimate	E_{12}: Benchmark estimate	S_1	R_1
A_2: Promote free favorable publicity	E_{21}: Above benchmark	E_{22}: Above benchmark	S_2	R_2
A_3: Increase advertising	E_{31}: Below benchmark	E_{32}: Above benchmark	S_3	R_3
A_4: Decrease advertising	E_{41}: Above benchmark	E_{42}: Below benchmark	S_4	R_4
A_5: Switch advertising dollars to entertainment	E_{51}: Below benchmark	E_{52}: Below benchmark	S_5	R_5

as being no better on both criteria than at least one other alternative and worse on at least one criterion.

The remaining alternatives — 1, 3, and 4 — are now nondominated, which means no other alternative is better than these on both criteria. Reducing the alternative set to only nondominated alternatives puts the decision maker in the situation of facing a "Pareto optimal set" [Keeney & Raiffa, 1976, p. 70] of alternatives: one objective can be gained only at the sacrifice of another. Any choice of one alternative trades off one objective for another. The objectives have a special decision-defined simultaneity: all cannot be improved at once. This is conflict among simultaneous objectives. The simultaneity results from the alternatives available to the decision maker at decision time; obviously "current" and "future" are not simultaneous. The objectives are competing, so to speak, for the choice of a favorable alternative. Which one is chosen now depends on the relative importance of the objectives.

Values in MCDM

Conflict among objectives may be reduced or dissipated [Zeleny, in press] by changing the objectives, but this sidesteps the existing decision situation. Conflict among objectives is resolved for a given decision situation when the decision is made — i.e., when one of the alternatives is chosen for implementation.

In the example of Table 2, clearly Alternative 4 favors the current profit objective and Alternative 3 favors the growth objective. Alternative 1, status quo, may offer a balance between them but not achieve either at target levels.

Which alternative to choose? This now depends on the relative importance of the objectives. If current annual profit is the most important, Alternative 4 wins. Conversely, if growth is most important, Alternative 3 wins. If both are about equally important, Alternative 1 would win so far as our crude analysis in the example goes. The issues at stake in MBO are how each of the persons involved values the objectives — the manager on the one hand and the subordinate on the other. Whenever a manager or subordinate is caught between two or more simultaneous objectives — which specifically means having to choose one from among a set of nondominated alternatives — values come into play.

If in this conflict-among-objectives situation the manager's values differ greatly from those of the subordinate, action plans developed by the subordinate to achieve agreed-on objectives may be completely inappropriate, and discovery of this may occur only much later at after-the-fact review time. Therefore, it seems highly pertinent that values affecting resolution of conflict among simultaneous objectives be agreed on at goal-setting time. Yet we see that priorities and weights are suggested by only half the MBO authorities and that they mean by priorities the sequencing of decisions and by weights the allocation of resources. Seldom in the MBO literature are values or weights of relative importance discussed as devices to resolve conflict among simultaneous objectives even though the anecdotal part of the literature such as Odiorne's story tells tale after tale of just such conflict.

Awareness of Conflict Among Objectives in MBO

Here and there amidst the literature of MBO, organizational behavior, and general management are found insights into or peripheral hints of awareness of conflict among objectives in decision situations. For example, Lahti, in a report on implementation of MBO at a small college, said "overlapping objectives are difficult to set, attain, and evaluate" [1971, p. 31].

Many writers call for flexibility during the MBO cycle period and recommend that ensuing circumstances be taken into account at review time, but their advocacy of nonrigidity and latitude do not even mention conflict among objectives. It appears that MBO, in its call for consistency [Carroll & Tossi, 1973], integration [Raia, 1974], and clarity of purpose [Motamedi, 1976] is attempting to eliminate conflict among objectives by negotiation, discussion, and writing things down, rather than squarely facing the simultaneity being demanded by the decision situation.

Raia gives this issue one sentence in an entire book: "As a leader the manager's job is to provide for the simultaneous satisfaction of multiple and often conflicting goals and needs, but this is easier said than done" [1974, p. 9]. Raia also recognizes that MBO "tends to emphasize short-run perfor-

mance and results" and that performance reviews must "evaluate long-term implications of present accomplishments" [1974,p. 118].

None of these hints of awareness suggests any methods or techniques for resolving conflict among simultaneous objectives or for distinguishing the occurrence of simultaneous objectives from those that may be pursued sequentially on a priority basis or to different degrees according to weighted allocation of resources.

Koontz and O'Donnell discuss multiple objectives of enterprises and the difficulties in simultaneous execution of several plans to make consistent progress toward several objectives, recognizing that managers must selectively allocate their time. They also identify a pitfall of MBO resulting from "problems of interdependency of goals and the need to retain past gains as future gains are sought" [1968, p. 493].

Organizational behavior scholars identify a variety of conflicts, usually between persons and organizations [Carroll & Tossi, 1977; Katz & Kahn, 1966], including one type somewhat akin to the MCDM situation. This is an internal role conflict due to incompatible objectives, overload, or inconsistent expectations of others. The emphasis for organizational behaviorists is on managing the conflict by reducing or dissolving it external to the person, not on resolution in situations where simultaneous conflict among the objectives must be accepted and a decision made.

Drucker [1974, 1977] recognizes that conflicting objectives are common and states that such situations undermine spirit and performance. If the conflicts cannot be removed or prevented, he wants them at least out in the open and thought through. A device that reveals discrepancies in perceptions of objectives is the "manager's letter" written twice a year by each subordinate. According to Drucker,

> The "manager's letter" . . . brings out whatever inconsistencies there are in the demands made on a manager by his or her superior and by the company. Does the superior demand both speed and high quality when only one or the other is practical? And what compromise is needed in the interest of the company? Does the superior demand initiative and judgment of his managers but also that they obtain approval before they do anything? Does the superior ask for their ideas and suggestions but never uses them or discusses them? Does the company expect a small engineering force to be available immediately whenever something goes wrong in the plant, and yet bend all its efforts to the completion of new designs? Does it expect a manager to maintain high standards of performance but forbid that same manager to remove poor performers? [1974, p. 439; 1977, p. 66]

There are undoubtedly more instances of recognition of conflict among objectives scattered in the vast MBO and management literature, but nowhere is found practical decision-making help for the manager who faces conflicting simultaneous objectives that will not go away.

Lessons from MCDM for MBO: Management by Conflicting Objectives

Can MBO get practical help from MCDM? The literature on MCDM is filled with mathematics, utility functions, and computer programs. Recent emphasis has been on iterative procedures between decision analysts and managers. These are interview or questionnaire methods and interactive computer program techniques that are involving managers more and more with decision analysts and their models as decision making unfolds. In MBO, most managers and their subordinates must be their own decision analysts, and they do not have the background, training, or time to become involved with the complex methods of MCDM analysts. What, then, does MCDM have to offer MBO?

First, concepts from MCDM can help isolate and explicate those decision situations involving conflict among simultaneous objectives that require agreement at goal-setting time on values by both manager and subordinate. As Mintzberg [1973] points out, it is the power of managers' mental models that determines to a great extent the effectiveness of their decisions. The MCDM decision framework can provide a powerful mental model for discussion between manager and subordinate about their respective values. And, according to Mintzberg, both will be able to see the comprehensive picture in terms of its detail through a schematic framework for sharing of information. Mintzberg elaborates:

> Subordinates need much of the manager's regular verbal information — the new idea from a customer or the gossip of the supplier. They also need two types of special information from him. First they

rely on the manager to specify organizational values or goals. He must establish the key tradeoffs between profit, growth, protection of environment, and employee welfare. Second, subordinates look to the manager for a sense of direction, a plan. [1973, p. 177]

If both can agree on specific objectives, on criteria by which achievement will be measured, on some tentative alternatives that may be used to achieve them, and on which objectives must be obtained simultaneously for which there must be a tradeoff of one against the other for the forthcoming MBO period, then manager and subordinate have a common mental model for identifying values in terms of the relative importance of the conflicting objectives. If there is disagreement on these values, then the situation becomes conflict between two persons, which is the case more commonly addressed by the literature on conflict resolution (for example, see the *California Management Review* special section on conflict and the collaboration ethic [Thomas, 1978].

Ackoff [1978] describes a procedure for dealing with conflicts between persons, consisting of six steps. Paraphrasing the first two steps in terms of conflict over the relative importance of objectives, they are:

1. Both participants should listen to the other's views until they feel they can formulate the other's position in a way that is acceptable to the other, and then attempt to do so. If the effort of either participant is unacceptable to the other, the discussion continues until both succeed.
2. Once both participants can state the other's position to the other's satisfaction, both should formulate the factual or moral conditions under which they believe the other's position would be valid.

The remaining four steps can be paraphrased into suggestions that conflict over values be discussed in terms of an explicit MCDM framework to estimate the sensitivity of actual future decisions to the conflicting values. If conflict over values still remains, participants should return to the first step. Of course, as Ackoff and Emery [1972] also noted, identification of a dominant alternative solves the conflict over values by making the decision insensitive to values.

Any choice of action is based on assumptions. In management by conflicting objectives, the assumptions of concern are about values, because different assumptions may lead to different actions. Mitroff and Emshoff [1979] have reported a dialectical method for assumption specification and integration leading to development of "best strategies" for policy and planning. Their method capitalizes on conflict to provide consideration of new alternatives. The intent is to overcome the self-sealing character of many organizations and to penetrate below the surface or the structural characteristics of existing strategies. Mitroff and Emshoff provide methods for challenging existing policies and strategies among peers (horizontal conflict), but their assumption-making dialectical approach can be incorporated into MBO negotiations between managers and subordinates (vertical conflict) according to an MCDM decision framework to develop agreement on values. The guiding question would be: If values are assumptions that lead to decisions, what are the assumptions that lead to values? This sort of discussion between manager and subordinate would tend to penetrate the surface protection of implicit values and bring them out front for explication and discussion.

Quantifying Values

The MCDM literature offers a variety of formal methods for using values to resolve conflicts among simultaneous objectives. The ideal is to develop a single score or measure of merit for each alternative under consideration. This score would measure the efficiency or effectiveness of an alternative for all objectives combined. Many theoretical issues are involved in reaching this ideal. However, the MCDM approach is practical enough to allow development of an explication and assumption-challenging framework to apply to MBO. An example MCDM decision matrix with illustrative computations is shown in Table 3. This example embellishes the MCDM decision situation represented in Table 2 by adding two objectives not directly measurable in dollars.

An issue for the situation represented in Table 3 is the commensurability of objectives. Ackoff [1970] points out that conflicts can be resolved by formulating higher-level objectives expressed on a single scale. This solution applies only if different objectives are measured along the same scale, or if measures along one scale can be transformed into

Table 3
A Multiple-Criteria Decision Matrix

Values:	V_1: 4	V_2: 3	V_3: 1.2	V_4: 1		
Objectives:	O_1: Profit	O_2: Growth	O_3: Image	O_4: Morale		
Criteria:	C_1: Current Annual Department Profit (000)	C_2: Future Annual Department Revenues (000)	C_3: Change in Customer Inquiries	C_4: Change in Manager Complaints	Score	Rank
Tentative Alternatives:	Evaluations:	Evaluations:	Evaluations:	Evaluations:		
TA_1: Status quo	E_{11}: BM[a] $SE_{11} = 0.6$	E_{12}: BM $SE_{12} = 0.6$	E_{13}: BM $SE_{13} = 0.4$	E_{14}: BM $SE_{14} = 0.2$	$S_1 = 4.88$	$R_1 = 2$
TA_2: Promote free favorable publicity	E_{21}: −$5 $SE_{21} = 0.4$	E_{22}: BM $SE_{22} = 0.6$	E_{23}: +1% $SE_{23} = 0.5$	E_{24}: +10% $SE_{24} = 0.0$	$S_2 = 4.00$	$R_2 = 4$
TA_3: Increase advertising	E_{31}: −$40 $SE_{31} = 0.0$	E_{32}: +$1,300 $SE_{32} = 1.0$	E_{33}: +16% $SE_{33} = 1.0$	E_{34}: −1% $SE_{34} = 0.3$	$S_3 = 4.50$	$R_3 = 3$
TA_4: Decrease advertising	E_{41}: +$40 $SE_{41} = 1.0$	E_{42}: −$700 $SE_{42} = 0.3$	E_{43}: −30% $SE_{43} = 0.1$	E_{44}: +3% $SE_{44} = 0.1$	$S_4 = 5.12$	$R_4 = 1$
TA_5: Switch advertising dollars to entertainment	E_{51}: −$10 $SE_{51} = 0.3$	E_{52}: −$1,500 $SE_{52} = 0.0$	E_{53}: −50% $SE_{53} = 0.0$	E_{54}: −30% $SE_{54} = 1.0$	$S_5 = 2.20$	$R_5 = 5$

[a]BM = Benchmark

measures along another. Transformation of objectives into a common scale enables us to formulate more general objectives. Not only does this make it possible for us to resolve conflicts between low-level objectives but it also enables us to better understand and evaluate alternative courses of action. However, in Table 3 there is no common measure of achievement of the disparate and conflicting objectives. Keeney and Raiffa [1976] and others resort to utility theory and combine estimates of the utility achieved by alternatives for each objective to obtain a single total utility score for each alternative. This method operates like a simple point-scoring system with weights for several dimensions, but MCDM authors emphasize that they are not assuming comparability of utility of one objective for another or any absolute meaning to the total utility score. They claim they are assessing alternatives only against changes in utility for each objective. This concept of utility is so situational that the discovery of a better alternative for an objective would change the utility numbers for its existing alternatives. The technique for any one objective is to assign the highest utility number to the best alternative and the lowest utility number to the worst. Utility theorists use a scale of zero to one but the popular one-to-ten or one-to-a-hundred scales are equivalent. Between these two extremes, scaling of the remaining alternatives leads to a utility function for each objective. Then a weighted average utility is computed for all alternatives to generate a total score by which alternatives may be ranked. The weights, of course, represent the values or relative importance of the objectives.

It is important to note that the weights need not take any particular form so long as they are meaningful among themselves. Therefore, a procedure for obtaining weights or values is to first rank the objectives by relative importance. Again, the ranking may change if a new objective is added. An easy and effective way to do this is to say the least important objective has a value of one. Then, all others are expressed as multiples of this objective. For example, the most important objective may be ten times more important than the least important. These weights may be scaled, as Keeney and Raiffa [1976] prefer, so that the most important has a weight of one, or they may be normalized to look like proportions by summing them and dividing by the sum. The alternatives will be ranked the same by all three weight-scaling methods. Again, the weights as values are situational and depend on all ingredients of the MCDM scheme and refer only to the relative importance of changes due to alternatives available. If all weights turn out to be equal — say, all one's — then they may be ignored and the utilities (SE_{ij}'s) added directly, as is frequently seen in many point-scoring schemes.

With this simplified MCDM framework and quantification technique in mind, we may now define a procedure for conducting negotiations between manager and subordinate in goal-setting,

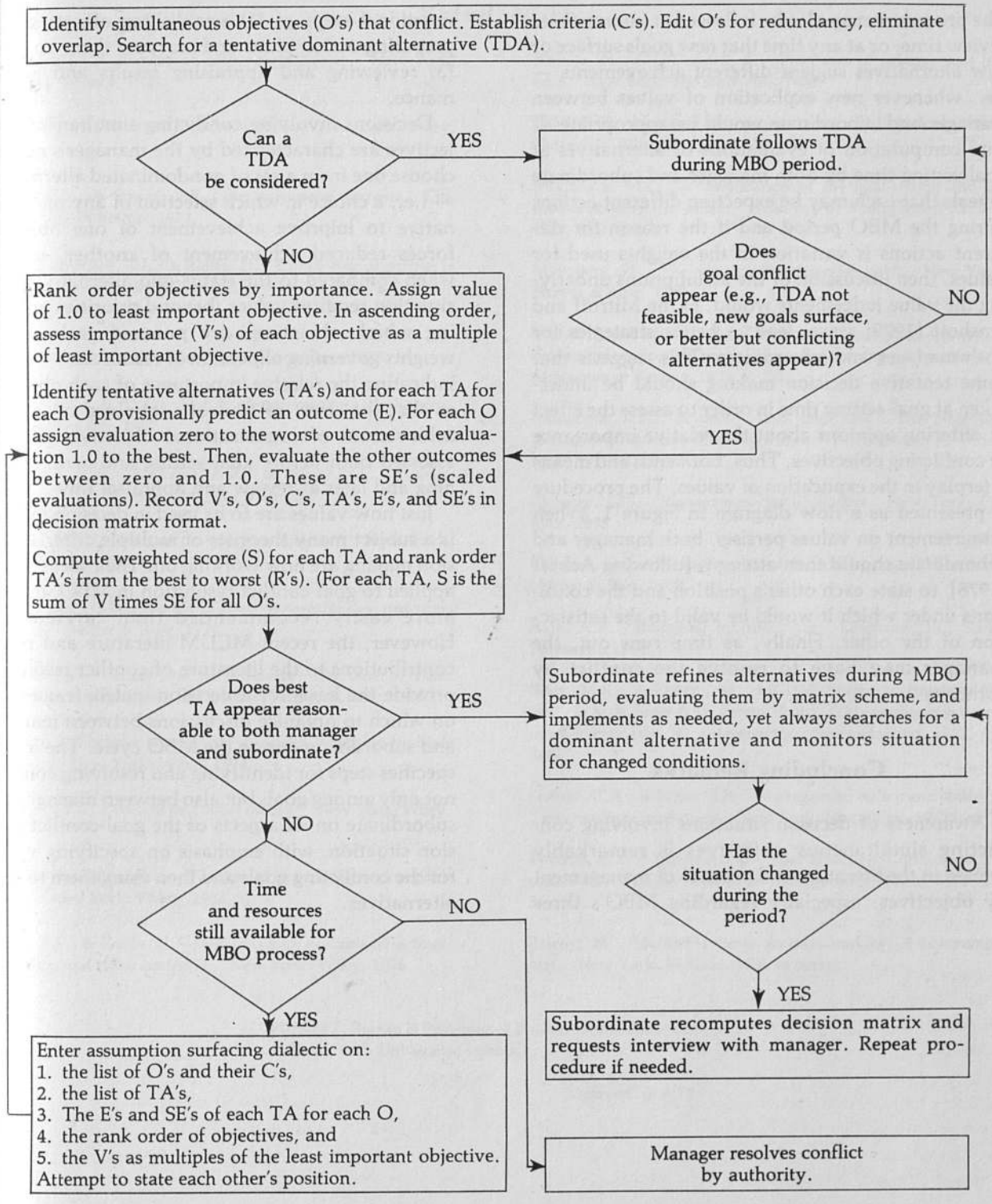

Figure 1
Value-Generating Procedure for Resolving Conflict of Objectives

The procedure may also be followed at intermediate review time, or at any time that new goals surface or new alternatives suggest different achievements — i.e., whenever new explication of values between manager and subordinate would be appropriate. If trial computation of evaluations of alternatives at goal-setting time by both manager and subordinate reveals that each may be expecting different actions during the MBO period and if the reason for different actions is variation in the weights used for values, then discussion of the assumptions underlying the value judgements would, in the Mitroff and Emshoff [1979] sense, lead to better strategies for both manager and subordinate. This suggests that some tentative decision making should be undertaken at goal-setting time in order to assess the effect of differing opinions about the relative importance of conflicting objectives. Thus, both ends and means interplay in the explication of values. The procedure is presented as a flow diagram in Figure 1. When disagreement on values persists, both manager and subordinate should then attempt, following Ackoff [1978], to state each other's position and the conditions under which it would be valid to the satisfaction of the other. Finally, as time runs out, the manager may have to resolve the conflict by authority.

Concluding Remarks

Awareness of decision situations involving conflicting simultaneous objectives is remarkably limited in the literature and practice of management by objectives, especially regarding MBO's three functional steps of (1) establishing objectives, (2) preparing action plans and carrying them out, and (3) reviewing and appraising results and performance.

Decisions involving conflicting simultaneous objectives are characterized by the manager's need to choose one from a set of nondominated alternatives — i.e., a choice in which selection of any one alternative to improve achievement of one objective forces reduced achievement of another, usually when compared to the status quo alternative. This situation requires values (beyond priorities governing which objectives are pursued earliest and weights governing allocation of resources) — values indicating the relative importance of each objective so that the effect of tradeoffs involved on overall achievement of organizational objectives may be assessed both before goal setting and action planning and later at review and appraisal time.

Just how values are to be used in decision making is a subject many theorists of multiple criteria decision making are now working on. Their ideas, when applied to goal-conflict resolution in MBO, may be more easily recommended than carried out. However, the recent MCDM literature and recent contributions to the literature of conflict resolution provide the basis for a decision matrix framework on which to organize discussions between manager and subordinate during the MBO cycle. The matrix specifies steps for identifying and resolving conflicts not only among goals but also between manager and subordinate on all aspects of the goal-conflict decision situation, with emphasis on specifying values for the conflicting goals and then using them to rank alternatives.

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