

HOW CONSTRUCTION MANAGERS WOULD LIKE THEIR PERFORMANCE TO BE EVALUATED

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ABSTRACT: Communication of the expectations of the construction organization and those of the construction managers is a key management function for motivating and developing professional construction managers. This paper explains how the successful design and implementation of an effective performance appraisal system will improve construction managers' performance. It also explains the details of a study that was carried out in one of the largest contracting companies in the Middle East to determine and quantify the performance criteria by which construction managers would like their performance to be measured. One hundred ten construction managers participated in the study. They generated 52 ideas for performance measures. These were combined together to form 12 measures. For example, the first measure is the level of effectiveness, and this was given as 15% of the overall performance. The 12 measures were further analyzed and categorized into five areas that were considered by the project managers to be the most determining areas in which they would like their performance to be measured. For example, measurement of efficiency represented over 35% of the preferred performance measures.

INTRODUCTION

Contracting companies' performance depends mainly on construction managers' performance. An effective performance appraisal system is an essential step for contracting firms wishing to survive and compete in the current changing and competitive market. Performance appraisals have been around for a long time as a means of assessing an individual's performance and, hence, determining compensation and reward strategies. Performance appraisal is also used for a wide variety of reasons, such as the determination of pay levels, counseling, training and development, promotion, staff planning, and retention/discharge. A simple definition of performance appraisal is given in DeVries (1986). It is the process by which organizations establish measures and evaluate individual employees' behavior and accomplishments for a finite period of time. However, employee appraisal is, more accurately expressed, a performance appraisal of both employee and employer.

One of the most important aspects of total quality management (TQM) as a philosophy of business management is its focus on employees' involvement and participation. TQM encourages the delegation of responsibility and authority to the lowest levels possible through employee involvement, participation, and empowerment to make decisions. TQM has brought home the message that performance appraisal in the way it has been conducted is not very effective and certainly not very helpful in leading to higher productivity standards. Many performance appraisal systems have been criticized for their inadequacy in measuring true individual contribution and for creating situations of unfairness. They are also perceived as a means for managers to control employees and to bring about the discipline required for increasing productivity levels.

Various critical factors have been highlighted by several authors (Long 1991; Hemmings 1992; Wright and Braiding 1992; Zaire 1994). They emphasized that the factors that performance appraisal should include are, among other things, the full participation of employees, goal clarity, role clarity, and

developing continuous communication programs and feedback loops.

A survey carried out by the American Management Association (Moen 1991) has established the most common purposes for using performance appraisal. The survey showed that the primary reason for using performance appraisal is the determination of pay levels based on individual performance, while training and development is the third in order of priority. This suggests that senior managers place emphasis on results rather than focus on the development of individual employees to secure optimum performance standards. However, the reasons for conducting performance appraisals have to be justified in terms of the need to help encourage employees to work better through addressing their deficiencies in skill levels and through establishing their individual knowledge requirements. In addition, modern performance appraisal has to be capable of measuring "working smart" rather than "working hard."

The ASCE Committee on Engineering Management at the Individual Level (EMIL) recently conducted a survey on how various civil engineering firms manage their employee-appraisal programs. This was an update to a similar version conducted in 1981 (Shah and Murphy 1995). The recent survey identified areas of the appraisal process that need to be improved: consistency in the process and timing; improved training; good follow-up; firm commitment from the top management; and more open, sincere discussions.

Bates (1995) stated that the best way to achieve the desired performance by any employee is to draw a picture of what that performance looks like. Furthermore it is important to do this with input from the subordinate so that both the manager and subordinate agree that it defines the desired performance with respect to measurable and quantifiable criteria, priority rating, and standards to define the desired results. He conceded that it is hard work to create such a document and to have both manager and subordinate agree that it is fair and challenging.

Frameworks such as the Malcolm Baldrige National Quality Award (MBNQA) (LieFeld 1992) place great emphasis on the management of human resources in a more complete way. Section 4.4 of the Baldrige framework (employee performance and recognition) focuses on employee involvement/participation, compensation and rewards, and regular feedback.

Incorporation of an enhanced performance-appraisal process, based on proper channels of communication of the expectations of the organization and those of the construction managers, with regular feedback, is a key success factor in developing an effective TQM-based performance appraisal system. The measures of this system therefore, have to be

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communicated effectively and a process of negotiation, clarification, and acceptance has to take place. This can only be achieved by moving away from a mode of telling people what the performance criteria are and ordering them to perform to a new approach based on empathy, collaboration, openness, objectivity, understanding, individual participation in measure-setting, and acceptance of both the measures and the responsibility to perform. Obtaining construction managers' consensus opinion on the measures they would like their performance to be evaluated against, together with the weight that should be allocated to each measure, is therefore a vital step in the design and implementation of effective TQM-based performance appraisal systems.

OBJECTIVES OF STUDY

The objectives of this study were

1. To explain how the successful design and implementation of an effective performance appraisal system will improve construction managers' performance
2. To explain a method capable of obtaining consensus performance measures relevant to construction project managers in a contracting company
3. To determine these measures and their relative importance

PERFORMANCE MODELS

Vroom (1964) suggested on the basis of a number of experiments that the effects of motivation on performance are dependent on the level of ability of the worker, and the relationship of ability to performance is dependent on the motivation of the worker. He suggested a multiplicative relationship: $\text{performance} = f(\text{ability} \times \text{motivation})$. Porter and Lawler (1968), in their study of the relationships between motivation and performance, presented a conceptual model. Their model suggested that there are two factors determining the effort people put into their jobs: the value of the rewards to the individual insofar as they are likely to satisfy their needs, and the probability that rewards depend on effort, as perceived by the individual. They suggested two additional variables to effort that affect task achievement ability and role perceptions. They formulated the relationship: $\text{performance} = f(\text{effort} \times \text{ability} \times \text{role perception})$. Ability comprises individual characteristics such as intelligence, manual skills, and know-how. Role perception is what the individual wants to do or thinks one is required to do. The Porter-Lawler model was further developed by Schwab and Cummings (1970). Two refinements were introduced into this model. The first was that performance results in intrinsic or extrinsic rewards that, through a feedback loop, affect perceptions about the relationships between effort and reward and, hence, the amount of effort. The second was that satisfaction is affected not only by the existence of reward but also by perceptions about the extent to which the reward is fair and equitable. By a feedback process this determines the value of the reward, which also influences the amount of effort. Their model shows the interactive nature of performance and satisfaction. Satisfaction is contingent upon the receipt of equitable rewards following performance, but it influences perceptions about the value of rewards and, therefore, effort and performance.

In construction-related studies, Laufer and Borcharding (1981) focused on the effects of financial incentives on productivity, using the performance determinants: $\text{performance} = f(\text{ability} \times \text{motivation} \times \text{role perception} \times \text{facilitating and inhibiting conditions not under the control of the individual})$. They suggested that the last two variables in the equation depend, to a large degree, on the quality of management and

concluded that there are three main factors influencing construction workers' performance: ability, motivation, and quality of management (Laufer and Borcharding 1981). Maloney and McFillen presented a model of worker performance and reported research that validates the model within a construction context (Maloney and McFillen 1983, 1986). The model identifies four variables that influence the level of worker performance: (1) the worker's motivation as evidenced by the worker's effort; (2) the degree to which the worker possesses the requisite job-specific knowledge and skills; (3) the degree to which the worker possesses the requisite innate mental and physical abilities; and (4) the effectiveness of management in organizing the work and providing the necessary resources. The first three variables combine in a multiplicative fashion, whereas organizational constraints is an intervening variable. Maloney, using his model, presented a framework for the rationalization of the analysis of construction performance that will improve the effectiveness and efficiency of the analysis. The framework provides a decision tree that will guide construction managers as they analyze and, hence, improve performance (Maloney 1990).

APPRAISAL AS METHOD OF IMPROVING PERFORMANCE

Performance appraisal can be a useful method of improving performance and developing potential. To be fully effective, however, the managers who conduct appraisals need to be thoroughly trained in techniques for agreeing on objectives and counseling their staff. The mechanism of performance improvement could be explained in terms of Maloney's determinants of performance (Maloney 1990). There are four main factors influencing construction managers' performance: effort, knowledge and skills, ability, and organizational constraints.

It is reasonable to postulate that the application of a proper performance appraisal system will improve construction managers' effort, knowledge, and skills, as well as reduce organizational constraints, which in turn will improve performance. If the reward is valued by the construction managers, they will strive to improve their performance. Exerting more effort will be the immediate response, but it is likely that the construction managers will attempt to upgrade their skills and knowledge to reduce the effort needed to achieve the same level of performance. In addition, one of the objectives of an effective performance appraisal system is to focus on the development of individual construction managers to secure optimum performance standards through addressing their deficiencies in skill levels and through establishing their individual knowledge requirements. This will direct senior managers' attention to training needs, which will improve construction managers' skills and knowledge.

The performance appraisal system should be capable of determining whether construction managers have the physical and mental abilities necessary for performing their current tasks. These abilities are innate and there is no training program that can provide them (Maloney 1990). Nevertheless, the identification and recognition of differences of ability in construction managers will assist in making job assignments that suit these differences. It will also indicate the need for improved selection, assignment, and training for senior project managers to better recognize differences of ability in construction managers and to take these differences into account in making job assignments. It is, therefore, reasonable to postulate that in the long term, performance appraisal will tend to improve the utilization of the construction managers' abilities as well.

The incorporation of an enhanced performance appraisal process will identify and eliminate any organizational con-

straints, provided the process is based on negotiation, clarification and acceptance of performance measures, and on effective channels of communication of the expectations of the organization and those of the construction managers, with regular feedback. When the work environment is free from organizationally imposed constraints and when senior management is performing its job effectively, construction managers will be able to fully use their capabilities, which in turn will improve their performance.

In summary, a successful performance appraisal system will improve construction managers' performance by affecting all four performance determinants.

CASE STUDY

Participants and Company

One hundred ten selected construction project managers participated in this study, all from The Arab Contractors Company, Osman A. Osman & Co. This company is the largest contracting company in Egypt and one of the largest in the Middle East. Its annual work volume is about 3,300,000,000 Egyptian pounds (\$1,000,000,000) and its market share is about half the contracting market in Egypt. It employs 69,406 employees, 3,493 of whom are qualified engineers, 2,434 of whom are foremen, and 49,688 of whom are technicians and laborers (*Annual 1995*). The 110 participants' age range was 35–45 years. They represented successful project managers in the company and they had from 10 to 20 years of work experience. The participants all had university degrees in engineering. They were or had been project managers in the company. All were defined by their superiors as successful project managers.

Methodology and Data Collection

The data of this study were collected from the participants through the application of the "nominal group technique" (NGT), one of many structured group processes that have been designed and developed. The NGT takes its name from the fact that it is a carefully designed, structured group process that involves carefully selected participants in some activities as independent individuals, rather than in the usual interactive

mode of conventional groups. It is a special purpose technique, useful for situations where individual judgments must be tapped and combined to arrive at decisions that cannot be reached by one person. The NGT is a problem-solving or idea-generating strategy. It is a well-developed and tested method that is fully presented in the work of Delbecq et al. (1975). Since its development in 1968, the NGT has gained extensive recognition and has been widely applied (Sink 1985). NGT has four phases in addition to an introduction, task statement, and a conclusion. The session group consists of 8–15 participants and the session is controlled by a process consultant and an assistant. The duration of the session is about three hours.

In this study the application of the technique was carried out in the company attended by the participants in the Arab Contractors Training Institute (ACTI). The data were collected during 11 NGT sessions over a period of 11 months. Each session had, on average, 10 participants, with the writer acting as the facilitator. The study objective was to obtain from the construction project managers a consensus conclusion on the measures by which they would like their performance to be measured, together with each measure's relative importance. The data are biased on one aspect: all the participated project managers were defined by their superiors as successful ones. The results represent the views of the successful construction project managers of the company. They do not necessarily represent all Egyptian construction project managers. However, in view of the size and market share of this company (about 50%), the results should give a good guide to the attitude of Egyptian construction project managers working in the contracting field towards desirable performance measures.

Voting and Scoring Results

The results of the sessions were analyzed and the participants' conclusions, with minimal modification in the wording, were obtained. Fifty-two ideas were identified, which were combined into 12 measures. Voting and scoring were carried out for these 12 factors. The results are shown in Figs. 1 and 2. They represent the consensus of opinion of the construction managers on the measures they would like their performance to be measured against, together with the relative importance of each measure as a score and a percentage, respectively.

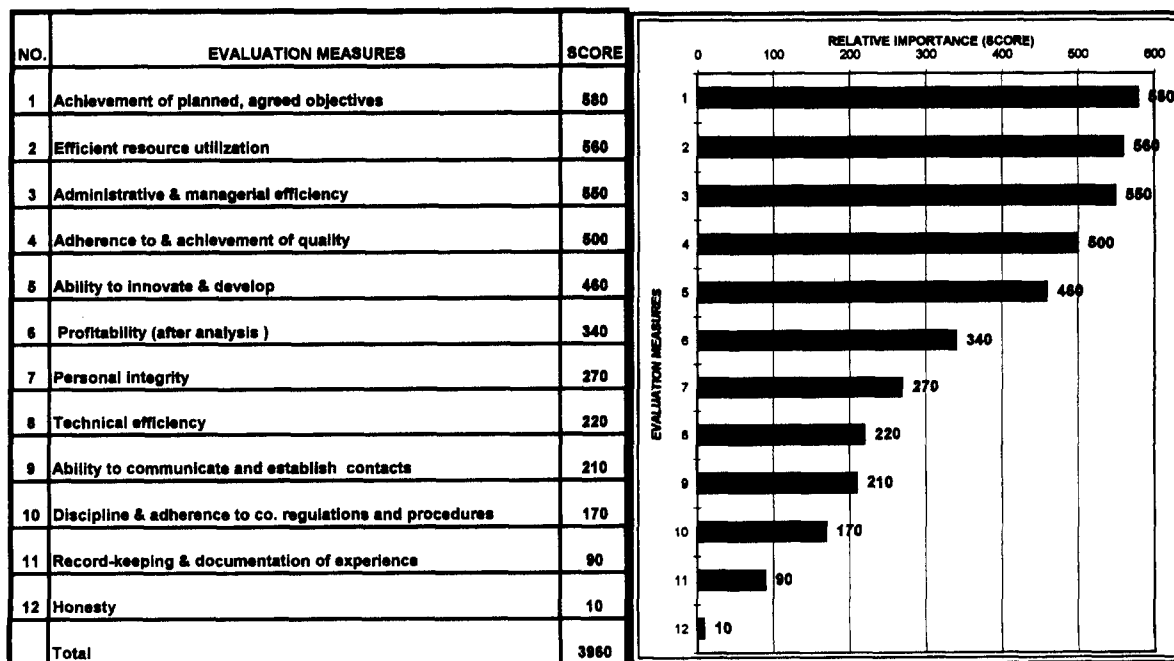


FIG. 1. Project Managers' Performance Measures: Voting and Scoring Results

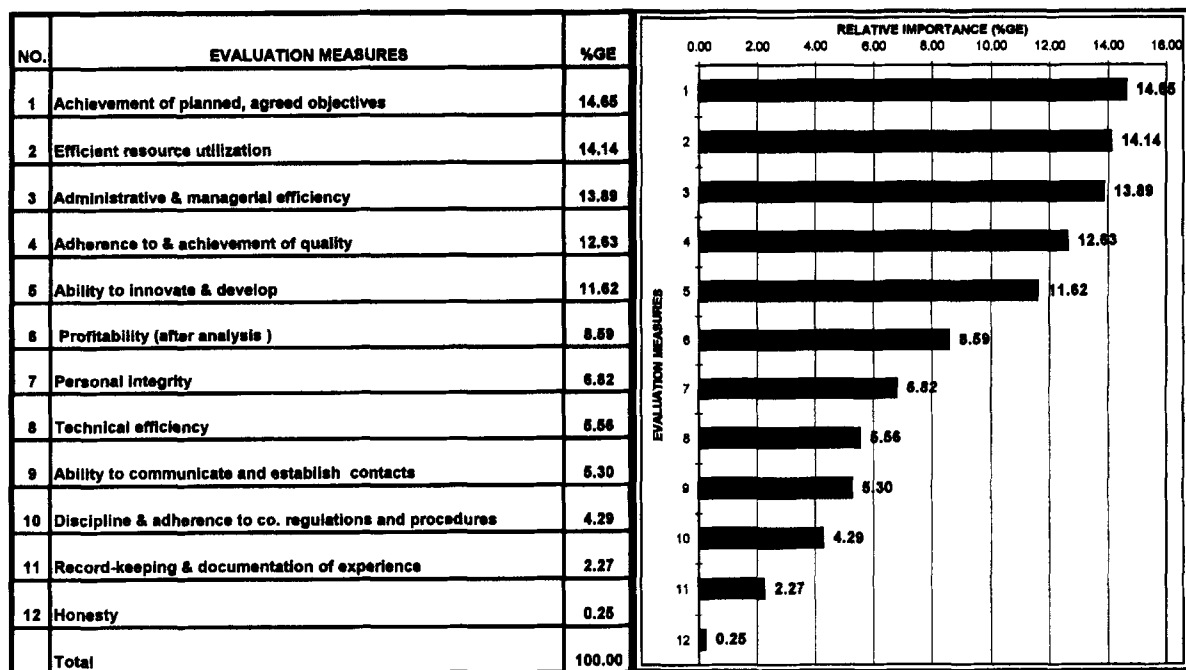


FIG. 2. Project Managers' Performance: Measures and their Percentage Values

TABLE 1. Pareto Analysis of Performance Measures

Measure number (1)	Measure weight (%) (2)	Cumulative number of measures (3)	Cumulative number of measures (%) (4)	Cumulative weight (%) (5)
1	14.65	1	8.33	14.85
2	14.14	2	16.67	28.79
3	13.89	3	25.00	42.68
4	12.63	4	33.33	55.31
5	11.62	5	41.67	66.93
6	8.59	6	50.00	75.52
7	6.82	7	58.33	82.34
8	5.56	8	66.67	87.90
9	5.30	9	75.00	93.20
10	4.29	10	83.33	97.49
11	2.27	11	91.67	99.76
12	0.25	12	100.00	100.00

A Pareto analysis of the 12 measures was carried out to show the relationship between the number of measures and their corresponding relative importance. The results are shown in Table 1. They show that one-half of the measures represent more than 75% of the total weights of all the measures, while three-quarters of them represent 95%.

The six highest priority measures and their relative values are achievement of planned, agreed objectives (14.65%), efficient utilization of resources (14.14%), administrative and managerial efficiency (13.89%), adherence to and achievement of quality (12.63%), ability to innovate and develop (11.62%), and profitability after analysis (8.59%).

The next three measures in order of priority contribute 17.68% of the total value of all the measures. These are personal integrity (6.82%), understanding the nature of the work and technical efficiency (5.56%), and ability to communicate and establish contacts (5.30%). The remaining three measures are discipline and adherence to company regulations and procedures (4.29%), record keeping and proper documentation of gained experience (2.27%), and honesty (0.25%).

Analysis and Implications of Results

The analysis of the voting and scoring results showed that the 12 measures could be categorized into five broad areas that

were considered by the project managers to be the most determining areas in which they would like their performance to be measured. Table 2 gives the constituent measures of each category together with the percentage value given to each measure. These categories and their approximate relative values are efficiency (35%), personal traits (30%), effectiveness (15%), quality (12%), and profitability after analysis (8%).

1. **Efficiency:** The importance of project managers' overall efficiency as a performance measure was emphasized by the managers. They allocated more than 35% to four measures that represented different types of efficiency. The constituent efficiency measures were efficient resource utilization, administrative and managerial efficiency, technical efficiency, and record keeping and documentation of experience.
2. **Personal Traits:** The analysis revealed that, when combined, the measures that could be categorized as "personal traits" were placed as the second category in order of importance. The project managers allocated nearly 30% of the total weight to five measures that represented constituent measures of personal traits. These were ability to innovate and develop, personal integrity, ability to communicate and establish contacts, discipline and adherence to company regulations and procedures, and honesty. All the performance measures could be further classified into two main areas of performance appraisal: personal traits measures and results-oriented measures. The weights given by the project managers to each of these performance measures were approximately 30 and 70%, respectively.
3. **Effectiveness:** The degree to which planned objectives are achieved indicates the degree of effectiveness. The highest value for a single measure was given by the project managers to effectiveness. This measure represented 15% of the preferred performance measures. This result should not be surprising but reflects the importance of effectiveness as a success factor in the contracting business. However, the project managers emphasized that the degree of their achievement must be compared to planned, clear, and agreed-on objectives. That is, they

TABLE 2. Performance Evaluation: Categories and Constituent Measures

Number (1)	Category (2)	Constituent measure(s) (3)	Measure weight (%) (4)	Category weight (%) (5)
1	Efficiency	Efficient resource utilization Administrative and managerial efficiency Technical efficiency Record-keeping and documentation of experience	14.14 13.89 5.56 2.27	35.86
2	Personal traits	Ability to innovate and develop Personal integrity Ability to communicate and establish contacts Discipline and adherence to company regulations and procedures Honesty	11.62 6.82 5.30 4.29 0.25	
3	Effectiveness	Achievement of planned agreed objectives	14.65	
4	Quality	Adherence to and achievement of quality	12.62	
5	Profitability	Profitability (after analysis)	8.59	
	[Total]		[100.00]	[100.00]

themselves must be involved and must participate in the process of setting up objectives.

4. Quality: The project managers gave "adherence to, and achievement of quality" a value of over 12%. They placed quality, as a single measure, fourth in order of priority. The managers reflected their recognition of the importance of quality in construction and their willingness to achieve high-quality products. However, they restricted and limited the measurement of quality to one measure: the acceptance of the work by the consultant or client's representative. This reflects the lack of understanding of the wider scope, the modern approaches, and the growing importance of quality in the modern construction market. This highlights the need to correct and modify their attitude as well as to explain the details of the constituent measures of quality when implementing the performance appraisal system that they will be measured against.
5. Profitability: Profitability may be expressed in a variety of ways, from the simple profit margin, to return on net worth, to a variety of financial ratios. Long-term survival of any business, including contracting, depends on the revenues generated by the firm exceeding the cost of producing the revenues. If the firm is not profitable, it will eventually cease to exist. Despite the fact that all project managers participating in the study recognized the importance of profit to the company, they placed profitability the sixth measure by which they would like their performance to be measured. Moreover, they insisted on defining this measure as "profitability after analysis." The main reason was found to be that project managers do not want to be held responsible for contracts imposed on the company with little or no profit, contracts for which they have not participated in the cost estimates, and projects for which they do not have access to the detailed cost estimates and method statements. For these reasons the project managers' view seems to be a reasonable requirement. In the implementation of project managers' performance appraisal systems, and to measure profitability successfully, two options are available: the participation of the would-be project manager in the cost estimating process, or the participation of the allocated project manager, after the award of the contract, in the preparation of a second cost estimate and a revised bill of quantities, against which profitability would be measured.

CONCLUSIONS

The effective application of successful performance appraisal systems will improve the performance of construction

managers by affecting all the performance determinants. The application of NGT proved to be an effective method capable of obtaining consensus performance measures relevant to construction project managers.

The measures obtained and their relative importance represented the consensus of opinion of 110 project managers of a contracting company. Twelve measures were obtained. These, in order of priority, were achievement of planned and agreed objectives, efficient resource utilization, administrative and managerial efficiency, adherence to and achievement of quality, ability to innovate and develop, profitability after analysis, personal integrity, technical efficiency, ability to communicate and establish contacts, discipline and adherence to company regulations and procedures, record keeping and documentation of experience, and honesty.

The analysis of the results showed that one-half of the measures represented more than 75% of the total weight of all the measures, while three-quarters of them represented nearly 95%. It also showed that the measures could be classified into personal traits and results-orientated measures, with a general relative importance of 30 and 70%, respectively.

The 12 measures were further analyzed and categorized into five areas that were considered by the project managers to be the most determining areas in which they would like their performance to be measured. These areas with their approximate relative importance were measurement of efficiency (35%), measurement of personal traits (30%), effectiveness (15%), quality (12%), and profitability after analysis (8%).

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