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Quantifying the Criteria for Performance Appraisal of Project Managers in Pakistani Construction Industry

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Abstract
Assessing and benchmarking the expectations of the primary construction industry stakeholders (owners, architect/ engineers and contractors) from the project managers is a key management function for motivating and developing professional project managers. This research explains how the design and implementation of an effective performance appraisal system will improve project managers' performance in the construction industry. It also attempts to obtain consensus performance measures relevant to project managers in the Pakistani construction industry, and to rank their relative significance. Fourteen (14) evaluation measures for a project manager were developed via extensive literature review and expert interviews from a selected cross-section of local industry representatives. Next, a structured questionnaire was devised and administered to allow a broad cross-section of industry stakeholders to assess and rank the relative importance of these measures. "Achievement of planned, agreed objectives" received the top priority as a performance evaluation measure for project managers. The fourteen (14) measures were further analyzed and categorized into six areas that were considered by the industry stakeholders as the most determining areas in which they would like the performance of their project managers measured. "Personal traits" represented over 40% of the preferred performance measures. The study emphasizes that the rankings of the importance of skills can be a guide in the training of project managers both at the level of pre-qualification as well as post-qualification. They can also be used as a yardstick in evaluating a would-be project manager during interview and final selection.

Keywords
Project Manager, Performance appraisal, Evaluation measures, Construction industry, Pakistan.

1. Introduction

An effective project manager is the cornerstone in any successful project. Not only the performance of a project but also the performance of other members on board depends immensely on the attributes of the project manager leading the project. Generally, in the project oriented nature of the construction industry, performance of a project manager largely affects the project and in turn the performance of

all associated people and organizations. This is primarily owing to the very nature of the job of a project manager, which makes him/ her entirely responsible for the success or failure of a project. It is the project manager who is entrusted with the responsibility to accurately define a project and then comprehensively develop and implement its work plan. If the scope of the project is ambiguously defined or is incomplete, or if the project is inadequately planned or controlled, it is highly probable that the project and hence the team suffers from performance issues, for which the project manager takes the major share of responsibility. On a similar note, in most cases, it is the result of the eminent efforts of a project manager that a project follows its schedule, meets its planned objectives and ultimately becomes successful. Thus, utilizing adequate energies in the development process of project managers, appraising their performance using the right measures, and improving their performance by implementing the right improvement methodologies can lead to drastically improved results for an organization as well as its projects. Evidence suggests that when process performance is improved, the process result is improved (Carroll, 2002); this is totally applicable to the project manager performance improvement process in the construction industry.

Performance measurement lies in the realm of quality assurance, determining whether or not project managers are following accepted practices that promote successful on-project execution and driving behavioral modification (Carroll, 2003). The three primary stakeholders involved in design and execution (owner - architect/engineer - contractor) are always striving to have effective project managers in order to successfully deliver projects. The key challenge is attracting, retaining and investing in the right people, and removing the wrong people from the position of project managers. One way to confirm that the right people are leading the project is to implement an effective performance appraisal system for the project managers. Performance appraisal can be a useful method of improving performance and developing potential. Both individual and project performance are an indicator of a project manager's success and skill level and could suggest the need for training, mentoring or even termination (Cleland and Ireland, 2007). Incorporation of a comprehensive performance appraisal process, based on proper channels of communication of the expectations of the various stakeholder organizations, with regular feedback, is a key success factor in developing an effective performance appraisal system. Obtaining stakeholders consensus opinion on the measures they consider significant to evaluate project manager's performance against, together with the weight that should be allocated to each measure, is, therefore, a vital step in the design and implementation of effective performance appraisal systems. Development of such a system for the construction industry of Pakistan is the core objective of this research.

2. Context

Construction sector, the world over, is considered to be a basic industry on which the development of the country depends. To a great extent, the growth of a country and its development status is generally determined by the quality of its construction companies and their capability. Despite being one of the most neglected sectors in Pakistan, construction participates to increase the GDP and comprises about 14% of employment of total labor force (Labor Force Survey Report-Government of Pakistan, 2005-06). This industry is labeled as being backward because of its relative lack of use of the latest advances in technology, management styles and procedures. Indeed it invests very meager amounts in research and development, which hinders the industry's ability to adopt new technology and processes.

Compared to the past, the current decade is witnessing massive infrastructure growth in Pakistan. There are numerous infrastructure development projects in progress as well as under planning. All of these projects have the potential to lead the local Industry to gain glory, status and international recognition but only when appropriate efforts are extended to achieve the same. With the stage set for a golden era for development, the challenges are still higher. The "boom cycle" and corresponding shortage of labor trades has increased the need for industry participants to adopt and apply project management philosophy, tools and techniques to help them manage the industry performance and productivity in a sustainable long-term mode. As such, the role of project managers has become more significant than ever before.

With the strategic aim to devise a model for nurturing project management maturity in the industry that can lead the Pakistani construction industry to the success path, this research has been conducted as an essential step towards developing a quantitative criteria for performance appraisal of project managers in the construction industry of Pakistan, as perceived by the significant actors in the industry. Another major significance of this study is that it examines the relative difference in the importance of the evaluation measures in relation to performance appraisal.

Based on the results of the study, it is anticipated that patterns will emerge regarding the key performance traits of effective project managers. These results will allow each sector of the industry to attract, retain and invest in the right project managers that suit their particular needs i.e. will aid in the development and utilization of the most appropriately qualified personnel as project managers.

3. Research Objectives

The objectives of the study were:

1. To explain how the design and implementation of an effective performance appraisal system will improve project managers' performance in the construction industry.
2. To obtain consensus performance measures relevant to project managers in the Pakistani construction industry.
3. To determine these measures and their relative importance.
4. To investigate the collective group perspectives on the relative importance of the performance measures relevant to project manager of the three principal industry participants, i.e., the owners, the A/Es and the contractors; and

4. Appraisal As Method of Improving Performance

Performance appraisal can be a useful method of improving performance and developing potential. The mechanism of performance improvement could be explained in terms of Malony's determinants of performance (Maloney, 1990). There are four main factors influencing project manager's 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 project managers' effort, knowledge and skills, as well as reduce organizational constraints, which in turn will improve performance. Exerting more effort will be the immediate response, but it is likely that the project 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 project managers to secure optimum performance standards through addressing their deficiencies in skill levels and through establishing their individual knowledge requirements. It is important to realize here that, as has been suggested by Heerkens in his book (Heerkens, 2001), there is no single recipe for becoming a successful project manager; the skills required are quite diverse and their integration is very important for being a complete project manager. Some of the desired traits can be learned while for others, an individual's personality plays an important role. Figure 1 illustrates that mechanical skills can be learned or developed through self-study and training. This will direct top managers' attention to training needs, which will improve project managers' skills and knowledge. However, for other skills, the preferred mode of development moves from programmed learning to coaching and mentoring. At the far left on the figure are those traits that make up the very fabric of one's personality and can be developed only by being introspective through self-examination and self-analysis. While some of these traits and skills are intrinsic and training programs cannot develop those, the identification and recognition of differences of personality traits, knowledge and skills in project managers will assist in making job assignments that suit these differences. It will also indicate the need for improved selection, assignment, and training for top managers to better recognize differences of ability in project 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 project managers' personality traits, knowledge and skills.

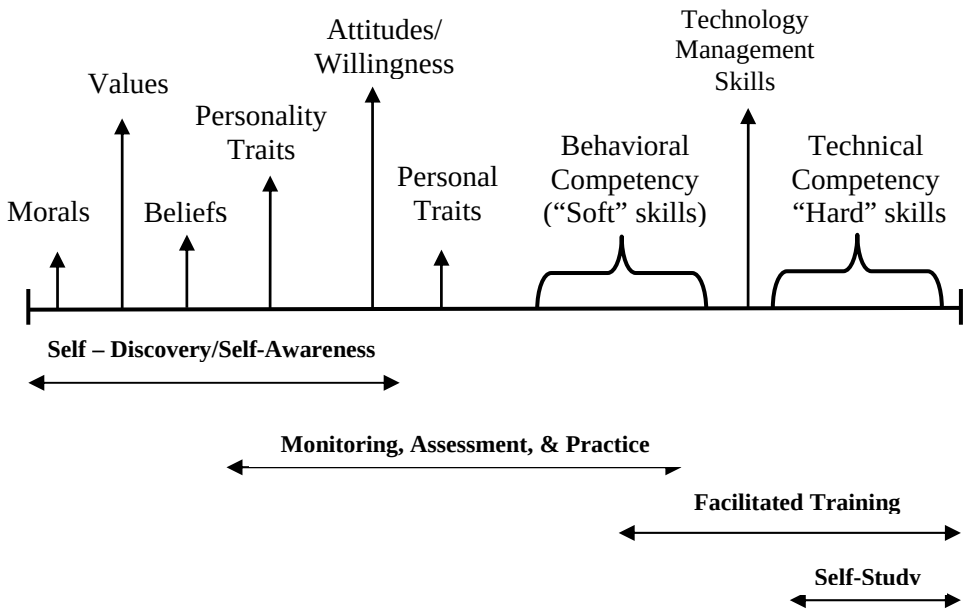

Figure 1: Personal Attributes and Their Development

The performance appraisal system should be capable of determining whether project 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 project managers will assist in making job assignments that suit these differences. Further, it will indicate the need for improved selection, assignment, and training for top managers to better recognize differences of ability in project managers and to take these differences into account in making job assignments. It is, therefore, reasonable to postulate that in the long term, pervformance appraisal will tend to improve the utilization of the project managers' abilities as well.

The incorporation of an enhanced performance appraisal process will identify and eliminate any organizational constraints, provided the process is based on negotiation, clarification and acceptance of performance measures, and on effective channels of communication of the expectations of the various stakeholder organizations, with regular feedback. When the work environment is free from any organizationally imposed constraints and when top management is performing its job effectively, project 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 project manager's performance by affecting all four performance determinants.

5. Methodology

The research methodology consisted of the following steps:

1. Literature review to develop a preliminary list of performance measures relevant to project managers in the construction industry.
2. Expert interviews from a selected cross-section of local construction industry experts to come up with a consensus list of performance measures relevant to construction project managers.
3. Development of a questionnaire to elicit information about the relative degree of significance of each evaluation measure, as perceived by the major actors in the construction industry.
4. Conducting survey through postal mail and interviews.

5. Assessment of feedback from survey to identify the overall perspective, the group perspective, as well as the relative difference in importance of evaluation measures for project managers as perceived by different groups.
6. Development of project manager performance appraisal criteria.

The methodology is explained as follows. In the first step, a thorough literature review was performed to develop a preliminary list of performance measures relevant to construction project managers. The literature review was done through books, conference proceedings, internet, and leading construction management and engineering journals. Selected from previous works (Katz and Thamhain, 1983 [cited in Kerzner (1989)]; Goodwin, 1993; Gushgar et al., 1997; Wateridge, 1997; Abdel-Razek, 1997; Odusami, 2002), twenty six (26) evaluation measures for a construction project manager were developed.

Following the preparation of a preliminary list of evaluation measures, expert interviews were conducted from a selected cross-section of local construction industry experts, including representatives from owner organizations, contractors, and A/Es. The objective was to obtain from the owners, A/Es and contractors a consensus conclusion on the evaluation measures by which the performance of project managers would be measured. As a result of the interviews, the twenty six (26) measures were combined to form a consensus list of fourteen (14) performance measures relevant to construction project managers. These finalized performance evaluation measures, along with their brief description, are given in Table 1.

In the next step, a structured questionnaire consisting of two parts was designed – parts A and B. Part A consisted of requesting respondent's personal information (e.g. work experience, position in company) and company information (e.g. type of organization, types of construction works performed, years in business, annual volume of work, number of employees). Part B consisted of the project manager's performance evaluation checklist developed earlier, requesting the respondents to evaluate the importance of these measures from their perspective.

The data of this study were collected from the participants through postal survey. The questionnaire was circulated among owners, developers, general contractors, subcontractors and A/Es wherein they were asked to rank the relative importance of the various project manager performance evaluation measures. The surveys were aimed to be filled by the top management of the target organizations. Few unstructured interviews with selected respondents from the various groups of stakeholders were also conducted to clarify their responses and to discuss the survey results.

In the final steps, based on all the gathered information, a descriptive analysis was performed where all the fourteen (14) evaluation measures were analyzed and ranked on the basis of mean scores received for them. Finally, a project manager performance appraisal criterion was outlined. The analysis results and the proposed performance appraisal criteria are discussed in the following section.

6. Analysis and Discussion

6.1. Questionnaire Response Rate

The response rate for completed questionnaires is shown in Table 2.

This response rate (77.8%) is considerably good for a construction industry survey. In similar construction industry surveys, Farooqui et al. (2008) received a response rate of 57%, and Ahmed and Azhar (2004) received 30.4%. Baker (1998) reported that statistically reliable conclusion can be obtained from a sample size of 20 or more.

6.2 Respondent Characteristics

The respondents were divided into two groups with respect to their types of organizations. The first group was "owners" which represented 57.14% and included owners, developers and architect/

engineers. The other group was "contractors" which represented the remaining 42.86% and included general contractors, subcontractors, and design-constructors. The respondents with respect to their positions were top managers in their respective organizations. Almost all of them had over 20 years of construction industry experience.

Table 1: Glossary of Performance Evaluation Measures

Evaluation Measure	Brief Description
Professional ethics	Professional ethics covers the conduct and moral principles recognized as appropriate within the profession.
Technical efficiency	Ability to efficiently plan, monitor and report all technical aspects of the project and to ensure that the organizational technical standards are applied correctly.
Honesty	A human quality of communicating, acting truthfully, and the avoidance of misleading.
Ability to communicate and establish contacts	Ability to give, receive, process, and interpret information and building up new connections.
Personal integrity	In all dealings, firm adherence to a code of moral values including completeness, honesty, honour, forthrightness, straightforwardness and entirety.
Record-keeping and documentation of experience	Ability to collect, store, disseminate, and archive project information and documentation which develops the organization's capability to undertake current and future projects.
Discipline and adherence to construction regulations and procedures	To conform to the rules or orders regarding construction issues as defined by executive authority or regulatory agencies of a government.
Administrative and managerial efficiency	Ability of directing and managing the activities of the organization, program, project or major work packages efficiently.
Adherence and achievement of quality	To ensure that both the outputs of the project and the processes have met the required needs of stakeholders.
Efficient resource utilization	Ability to plan resources that are adequate for accomplishing the intended purpose.
Achievement of planned, agreed objectives	Ability to implement plans and to meet all the objectives of the project.
Adherence and achievement of safety	Applying appropriate standards and methods to minimize the likelihood of accidents, injuries or environmental impact both during the project and during the operation of its deliverables.
Ability to innovate and develop	Ability to work out new or extend the theoretical, practical, and/or useful application of an idea, concept, or preliminary design.
Ability to pre-assess profitability (after analysis)	Ability to accurately pre-assess the final amount remaining after all costs (mostly considering direct costs) have been paid from revenues generated.

Table 2: Breakdown of Responses

Total questionnaires sent	Questionnaires returned incomplete	Total number of potential questionnaires	Total valid responses received	Percentage of valid responses
87	6	81	63	77.8%

6.3. Relative Importance of Project Manager's Performance Evaluation Measures as Perceived by Significant Actors in Construction

The top managers of the surveyed firms were requested to evaluate the significance of the 14 evaluation measures as listed in Table 1. Respondents were asked to score each evaluation measure on a ten-point scale, starting with 1 for least degree of significance and 10 for highest degree of significance for a measure. The mean level of significance for each evaluation measure (based on the scale rating of responses) was calculated to obtain the importance index for each measure. The results of the surveys were analyzed and the participants' conclusions were obtained. The evaluation

measures were then ranked from the highest to the lowest for overall respondents, owners and contractors based on mean score obtained for each measure. The results are shown in Tables 3 – 5 and discussed in the following sub-sections.

6.3.1. Relative Importance of Project Manager's Performance Evaluation Measures as Perceived by Owners

Table 3 shows the ranking and the mean level of performance of various evaluation measures as perceived by the owner group (owners, developers, architect/ engineers).

The mean level of performance showed that the most important performance traits required in project managers, from the perspective of owners, in descending order of significance, include: achievement of planned, agreed objectives (9.49); administrative and managerial efficiency (9.38); and adherence to and achievement of quality (9.24). The three least significant performance traits for project managers, in descending order of significance, include: personal integrity (7.03); honesty (6.85); and adherence and achievement of safety (6.58).

Table 3: Performance Evaluation of Project Managers by Owners *(N=36)*

Rank	Evaluation Measure	Mean Score (on a scale of 10)
1	Achievement of planned, agreed objectives	9.49
2	Administrative and managerial efficiency	9.38
3	Adherence to and achievement of quality	9.24
4	Ability to communicate and establish contacts	9.09
5	Profitability (after analysis)	9.01
6	Discipline and adherence to construction regulations and procedures	8.63
7	Technical efficiency	8.55
8	Ability to innovate and develop	8.18
9	Efficient resource utilization	7.82
10	Record-keeping and documentation of experience	7.54
11	Professional ethics	7.23
12	Personal integrity	7.03
13	Honesty	6.85
14	Adherence and achievement of safety	6.58

6.3.2. Relative Importance of Project Manager's Performance Evaluation Measures as Perceived by Contractors

Table 4 shows the ranking and the mean level of performance of various evaluation measures as perceived by the contractor group (general contractors, subcontractors, and design-constructions).

The mean level of performance showed that the most important performance traits required in project managers, from the perspective of contractors, in descending order of significance, include: achievement of planned, agreed objectives (9.76); efficient resource utilization (9.54); and administrative and managerial efficiency (9.48). The three least significant performance traits for project managers, in descending order of significance, include: professional ethics (7.54); honesty (6.87); and personal integrity (6.69).

Table 5 shows the ranking and mean level of significance of project manager's performance evaluation measures, as perceived by the overall (average) construction industry respondents. Overall, when the weighted averages of the two groups are taken, the performance traits that received the top three positions, in descending order of importance, are: achievement of planned, agreed objectives

(9.61); administrative and managerial efficiency (9.42); and adherence to and achievement of quality (9.28).

Table 4: Performance Evaluation of Project Managers by Contractors *(N=27)*

Rank	Evaluation Measure	Mean Score (on a scale of 10)
1	Achievement of planned, agreed objectives	9.76
2	Efficient resource utilization	9.54
3	Administrative and managerial efficiency	9.48
4	Adherence to and achievement of quality	9.34
5	Profitability (after analysis)	9.26
6	Ability to innovate and develop	9.12
7	Ability to communicate and establish contacts	9.01
8	Record-keeping and documentation of experience	8.86
9	Discipline and adherence to construction regulations and procedures	8.73
10	Adherence and achievement of safety	8.23
11	Technical efficiency	8.03
12	Professional ethics	7.54
13	Honesty	6.87
14	Personal integrity	6.69

Table 5: Overall Performance Evaluation of Project Managers *(N=63)*

Rank	Evaluation Measure	Mean Score (on a scale of 10)	Percent (%)
1	Achievement of planned, agreed objectives	9.61	8.20
2	Administrative and managerial efficiency	9.42	8.04
3	Adherence to and achievement of quality	9.28	7.92
4	Profitability (after analysis)	9.12	7.79
5	Ability to communicate and establish contacts	9.06	7.73
6	Discipline and adherence to construction regulations and procedures	8.67	7.40
7	Ability to innovate and develop	8.58	7.33
8	Efficient resource utilization	8.56	7.31
9	Technical efficiency	8.33	7.11
10	Record-keeping and documentation of experience	8.11	6.92
11	Professional ethics	7.36	6.28
12	Adherence and achievement of safety	7.29	6.22
13	Personal integrity	6.88	5.87
14	Honesty	6.86	5.86
	Total	117.13	100.00

Table 6 collectively shows the significance ranking of the various performance measures relevant to evaluating project managers, as perceived by the different surveyed groups. With respect to agreement on the ranking of the importance skills as perceived by owner and contractor groups, both the owner group and the contractor group have put achievement of planned, agreed objectives on the first place, which makes it as the top most criterion for project manager performance evaluation. Similarly, administrative and managerial efficiency, adherence to and achievement of quality, and profitability after analysis are the traits among the top 5 evaluation measures for both owners and contractors. This consensus pattern is observed for most performance measures, where the ranking by owners and

contractors closely confirms to each other, implying that both groups largely agree as to the ranking if criteria for evaluating project managers' performance.

Table 6: Ranking of Performance Evaluation Traits for Project Managers by Different Groups

Evaluation Measure	Rank		
	Overall	Owner	Contractors
Achievement of planned, agreed objectives	1	1	1
Administrative and managerial efficiency	2	2	3
Adherence to and achievement of quality	3	3	4
Profitability (after analysis)	4	5	5
Ability to communicate and establish contacts	5	4	7
Discipline and adherence to construction regulations and procedures	6	6	9
Ability to innovate and develop	7	8	6
Efficient resource utilization	8	9	2
Technical efficiency	9	7	11
Record-keeping and documentation of experience	10	10	8
Professional ethics	11	11	12
Adherence and achievement of safety	12	14	10
Personal integrity	13	12	14
Honesty	14	13	13

A marked distinction in ranking is observed for the measure: efficient resource utilization, which has been marked as the second most important criterion by contractors but is a criterion of medium to low significance for the owners. This is understandable because efficient and effective resource utilization (manpower, equipment and material) is a much important concern for contractors as compared to owners, and hence the priority.

Another noticeable difference in importance ranking is observed for the measure: adherence to and achievement of safety. It is evident from the findings that the contractors pay higher regard to this trait and require their managers to be more skillful towards that, but the same is only given the least priority by owners as an evaluation measure for their project managers. Safety, being on the last priority, highlights a need to modify and correct owners' attitude towards safety.

Discipline and adherence to construction regulations and procedures, technical efficiency, professional ethics and personal integrity have been ranked slightly higher by owners as compared to contractors, whereas ability to innovate and develop, and record-keeping and documentation of experience have been ranked slightly higher by contractors as compared to owners. Honesty is ranked the same by both groups.

It is alarming to note that personal attributes including personal integrity and honesty, as well the professional trait of ethics are considered to be of least significance by both the groups for evaluating project managers. Considering this in light of the present scenario of construction industry in Pakistan can lead one to conclude that there is a general lack of importance of fair and transparent practices in the industry, which has led the industry players to put very low emphasis on the traits that may improve the situation. The Pakistani construction industry has to make itself realize that an honest and ethically correct professional (who do not engage in or condone behavior that is designed to deceive others, including but not limited to, making misleading or false statements, stating half-truths, providing information out of context or withholding information that, if known, would render the statements as misleading or incomplete) can go a long way to increase the credibility and reputation

of the industry as well as the profession of project management. Although such abilities are qualitative in nature and difficult to gauge against any benchmarks, there is no doubt that these abilities form essential ingredients of any person in general and project manager in particular.

6.4. Pareto Analysis of Performance Measures

A Pareto analysis of the 14 performance measures was carried out to show the relationship between the number of measures and their corresponding relative importance. The results are shown in Table 7. They show that one-half of the measures represent approximately 55% of the total weights of all the measures, while three-quarters of them represent approximately 80%.

Table 7: Pareto Analysis of Performance Measures

Measure number (1)	Measure Weight (%) (2)	Cumulative number of measures (3)	Cumulative number of measures (%) (4)	Cumulative weight (3)
1	8.20	1	7.14	8.20
2	8.04	2	14.28	16.24
3	7.92	3	21.42	24.16
4	7.79	4	28.56	31.95
5	7.73	5	35.70	39.68
6	7.40	6	42.84	47.08
7	7.33	7	50.00	54.41
8	7.31	8	57.12	61.72
9	7.11	9	64.26	68.83
10	6.92	10	71.4	75.75
11	6.28	11	78.54	82.03
12	6.22	12	85.68	88.25
13	5.87	13	92.82	94.12
14	5.86	14	100.00	100.00

6.5. Analysis and Implications of Results

The analysis showed that the 14 measures can be categorized into six broad areas that were considered by the industry stakeholders as the most determining areas in which they would like the performance of their project managers to be measured. Table 8 gives the constituent measures of each category together with the percentage value given to each measure. These categories and their approximate relative values are: personal traits (40%), efficiency (30%), effectiveness (8%), quality (8%), profitability (8%) and safety (6%).

The analysis revealed that, when combined, the measures that could be categorized as “personal traits” were placed as the top most category in order of importance, , constituting approximately 40%. This is a significant finding, especially after the finding that the traits of personal integrity, honesty and professional ethics were placed at the least significance level by all stakeholders, when considered individually.

The importance of project managers’ overall efficiency as a performance measure was emphasized as the second most significant category, constituting approximately 30%.

Table 8: Performance Evaluation: Categories and Constituent Measures

Number (1)	Category (2)	Constituent measure(s) (3)	Measure weight (%) (4)	Category weight (%) (5)
1	Personal Traits	Ability to innovate and develop	7.33	
		Discipline and adherence to construction regulations and procedures	7.40	
		Ability to communicate and establish contacts	7.73	
		Personal integrity	5.87	
		Honesty	5.86	
		Professional ethics	6.28	
				40.47
2	Efficiency	Efficient resource utilization	7.31	
		Administrative and managerial efficiency	8.04	
		Technical efficiency	7.11	
		Record-keeping and documentation of experience	6.92	
				29.38
3	Effectiveness	Achievement of planned, agreed objectives	8.20	8.20
4	Quality	Adherence to and achievement of quality	7.92	7.92
5	Profitability	Profitability (after analysis)	7.79	7.79
6	Safety	Adherence to and achievement of safety	6.22	6.22

The degree to which planned objectives are achieved indicates the degree of effectiveness of project managers. The highest value for a single measure was given by the stakeholders to effectiveness, which represented over 8% of the performance measures. This result should not be surprising but reflects the importance of effectiveness as a success factor for projects.

The stakeholders gave “adherence to and achievement of quality” a value of roughly 8%. They placed quality, as a single measure, fourth in order of preference. The stakeholders reflected their recognition of the importance of quality in construction business and their willingness to achieve high-quality products. However, most of them restricted the measurement of quality to one measure: client acceptance. This reflects the lack of understanding of the wider scope, the modern approaches and the growing importance of quality in the construction industry. This highlights a need to modify and correct their attitude towards quality.

Despite the fact that all stakeholders participating in the survey recognized the importance of profitability to a company, they placed profitability the fifth measure by which they would like to measure the performance of their project managers.

“Adherence to and achievement of safety” was placed at the last position by the stakeholders. This highlights a need to modify and correct the stakeholders’ attitude towards safety.

7. Conclusions

The effective application of successful performance appraisal systems will improve the performance of project managers by affecting all the performance determinants.

The measures obtained and their relative importance represented the consensus of opinion of 67 stakeholders from the construction industry. Fourteen measures were obtained. These, in descending

order of priority, were Achievement of planned, agreed objectives, Administrative and managerial efficiency, adherence to and achievement of quality, profitability after analysis, ability to communicate and establish contacts, discipline and adherence to construction regulations and procedures, ability to innovate and develop, efficient resource utilization, technical efficiency, record-keeping and documentation of experience, professional ethics, adherence and achievement of safety, personal integrity, and honesty.

The analysis of the results showed that one-half of the measures represent approximately 55% of the total weights of all the measures, while three-quarters of them represent approximately 80%.

The 14 measures were further analyzed and categorized into six areas that that were considered by the industry stakeholders as the most determining areas in which they would like the performance of their project managers to be measured. These areas with their approximate relative importance were: personal traits (40%), efficiency (30%), effectiveness (8%), quality (8%), profitability (8%) and safety (6%).

It is emphasized that the rankings of the importance of skills can be a guide in the training of project managers both at the level of pre-qualification as well as post-qualification. They can also be used as a yardstick in evaluating a would-be project manager during interview and final selection.

8. References

Abdel-Razek, R.H. (1997). "How Construction Managers would like their Performance to be Evaluated." *J. Constr. Engrg. and Mgmt.*, ASCE, 123(3), 208-213.

Ahmed, S. M., and Azhar, S. (2004). "Risk Management in the Florida Construction Industry". *Proceedings of the 2nd Latin American and Caribbean Conference for Engineering and Technology*, Miami, Florida, June 2-4.

Baker, S. W. (1997). *Risk Management in Major Projects*. Ph.D. Thesis, University of Edinburgh, UK.

Carroll, B.J. (2002). *Lean performance ERP Project Management*. St. Lucie Press.

Carroll, C. (2003). *Using the Trotter Matrix to Measure and Improve Project Manager Performance*, EDPACS 30(12), 1-17.

Cleland, D.I. and Ireland, L.R. (2007). *Project Manager's Handbook: Applying Best Practices across Global Industries*, McGraw-Hill Professional,

Farooqui, R.U., Saqib, M., and Ahmed, S.M. (2008). "Assessment of Critical Skills for Project Managers in Pakistani Construction Industry." *Proceedings of the First International Conference on Construction in Developing Countries (ICCIDC-I)*, Karachi, Pakistan, August 4-5, 2008, 221-234.

Goodwin, R. S. C. (1993). "Skills required of effective project managers." *J. Mange. Eng.*, 9(3), 217-226.

Gushgar, S. K., Francis, P. A., and Saklou, J.H. (1997). "Skills critical to long-term profitability of engineering firms." *J. Mange. Eng.*, 13(2), 46-56.

Heerkens, G. (2001). *Project Management*. McGraw-Hill Professional.

Kerzner, H. (1989). *Project management: a system approach to planning scheduling and controlling*, 3rd Ed., Van Nostrand Reinhold, New York.

Maloney, W.F. (1990). "Framework for analysis of performance." *J. Constr. Engrg. and Mgmt.*, ASCE, 116(3), 399-415.

Odusami, K. T. (2002). "Perception of Construction Professionals Concerning Important Skills of Effective Project Leaders." *J. Mange. Eng.*, 18(2)

Wateridge, J. (1997). "Training for IS/ IT project managers: a way forward." *Int. J. Proj. Manage.*, 15(5), 283–288.