

Personnel Performance Appraisal Dimensions For Indian Construction Organizations



Chaithra N Kowshik, Gangadhar Mahesh

Abstract: *Personnel Performance Appraisal (PPA) is a Human Resource Management (HRM) tool which helps to improve individual performance and there by enhance organization and industry performance at large. However, Personnel performance appraisal practice in construction organizations is poor. This is associated with lack of clear performance measurement dimensions. The purpose of this paper is to identify personnel performance appraisal dimensions for Indian construction organizations. In this study mixed method approach is adopted, different performance appraisal dimensions were identified through literature review and a questionnaire was developed. Also, semi structured interviews with professionals from construction organization was conducted.*

The survey has identified 7 Key performance dimensions. Additional performance dimensions applied in construction organizations were identified through the interviews and were categorized in to quantitative and qualitative dimensions. The interview findings show that the quantitative measures are given more attention than qualitative measures in the organizations.

Effective performance appraisal system needs setting objective dimensions to measure performance. The qualitative and quantitative dimensions identified in this study will help construction organizations to improve their personnel performance appraisal system in particular and the HRM practice in general

Keywords : *Appraisal; ; Construction organisation; Job performance; Performance Dimensions.*

I. INTRODUCTION

Construction sector is project based and dynamic in nature which does not allow Human Resource (HR) managers to carry out their functions effectively [31]. Construction work is labor oriented which has adopted many technologies and management techniques, however less attention has been given to people management and job performance issues [12][15]. Unlike other industries, construction industry has complex characteristics when it comes to Human Resource Management (HRM). One of the main issues in HRM is performance management practices. Personnel Performance

Appraisal (PPA) system is a part of HRM practice which helps to improve individual performance thereby improving organization and industry performance at large.

Performance appraisal is a formal management tool that evaluates individual performance in an organization which can influence individual's career and work life [24][13]. Effective HR practices will influence many factors like organizational performance, individual performance and financial performance [33]. PPA is used to take administrative decisions for the management in terms of employee retention and career development of an employee.

Performance is measured based on what has to be done and what is expected in the task, which is measured on the basis of certain identified performance dimensions for the task. But human behavior or performance is unstable; hence there is the necessity for monitoring and revising Performance Dimensions (PDs). This study particularly focuses on identifying standard performance measures, i.e. PDs, and also classifies into KPDs for the assessment of construction personnel.

II. LITERATURE REVIEW

Job performance can be classified as individual performance, group performance, and organizational performance. Individual performance refers to activities performed by an employee to meet intended organization goals [23]. Individual performance plays a vital role in an organization. [28], describes job performance as a multidimensional concept based on task performance, contextual performance and adaptive performance. Task performance has a direct impact on organization goals, in other words, it is work done by the employee as specified by the organization. Contextual performance has an indirect effect on organization goals but supports the working environment. Adaptive performance relates to a dynamic working environment where the employee has to adapt quickly to uncertainties. [20] discussed counterproductive performance i.e. individual negative behavior which affects organization performance.

Performance appraisal is also known as job performance evaluation which evaluates individual performance in an organization [11][24] and is defined as "a formal, structured system of measuring and evaluating an employee's job-related attributes, behaviors, and outcomes to assess an employee's productivity and judge whether he or she will perform equally well or more effectively in the future, so that the employee, the organization, and society all benefit".

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In the construction industry measuring individual performance becomes difficult when the work is interdependent. In such cases, job performance could be perceived as an individual's overall performance on specific dimensions, such as quality and quantity of work [12]. Performance evaluation design varies among employers. The employer faces challenges in measuring the performance when employees perform multiple tasks. In such cases, it would be easy to measure performance based on particular situation of a job and based on appraiser judgment [1]. According to [8] a successful performance appraisal system not only evaluates an employee but also creates a system that is fair and satisfactory.

The first step in PPA evaluation is identifying Key Performance Standards [22]. Key Performance Standards also known as Key Performance Indicators in many studies. In this study, the term Performance Dimension (PD) is being used instead of different terms. Key performance Dimension(KPD) represent a set of PDs that focus on those aspects of organizational performance that are the most critical for current and future success of the organization, and are used as a necessary tool by managers , supervisors to know whether they are successful or not in achieving the objectives. [20][27]. Effective performance evaluation of an employee in medium or large construction organization should be designed as an integrated system of KPDs which is designed hierarchically at all levels and linked with organization objectives [21].

A. Performance Dimensions in Construction Industry

Performance Dimensions found in literature is with respect to job or particular designation in the Construction Industry (CI) is as summarised below in Table I

Table I Identified Performance Dimensions

Authors	Description	Performance Dimensions Relevant to CI
[3]	Identified performance criteria for construction project managers related to individual performance	Team building, Decision-Making Mutuality and Approachability, Honesty and Integrity, Communication, Learning, Understanding and Application Self-Efficacy, External Relations.
[4]	Managerial competencies are identified for recruitment and to improve the mangers	Composure, Team leadership, Directiveness/assertiveness , Achievement orientation, Analytical thinking, Flexibility, Teamwork & co-operation, Initiative, Information seeking, Conceptual thinking, Impact & influence, Focus on client's needs
[5]	listed out criteria to be considered in Performance Evaluation process for electrical construction contractors	Leadership, personal conduct, sets good example, communication skills, public/customer relations, attendance, attitude, trustworthiness, ability to motivate, dependability, productivity, ability to catch mistakes, quality of work, ability to deal with problems, safety awareness, delegation of responsibility, ability to instruct, work

		ethic, initiative, accepts responsibility, ability to work with others, knowledge of work, planning, communication with crews, scheduling, and maintenance of records.
[13]	Identified task related dimensions which would maximize project outcomes	Responsibility, Quality Of Work ,Ability Job Knowledge, Experience, Efficiency, Accuracy, Judgment and Initiative
[14]	Identified required skill sets for construction manager for better project outcome when the complexity is more	Technical skill and Experiential Knowledge, Communication and People Skills, Leadership, Planning and Risk Management, Vision and Focus On end results.
[18]	identified attributes of project coordinator for the project success	Timeliness, Maintaining records ,Interpersonal skills, Relationship with client, consultant and contractor Technical knowledge of the subject, Coordination for achieving quality, Liaison skills, Knowledge of project, finance, Communication skills ,Reliance on systematic approach, Understanding of contract clauses, Monitoring skills, Planning skills ,Forecasting skills, Facilitating skill ,Resource utilization skills, Belief in team playing spirit, Analytical skills ,Concern for other's ego Concern for conciliation, Motivating skills, Follow up quality
[19]	necessary skills for the project leader are identified through perception of Contractors, clients, consultants for successful projects.	Leadership, Planning, Team building, Controlling, Organizing Communication, Delegation, Decision making, Business knowledge, Technical knowledge, Stress management, Problem solving, Staffing and Directing
[25]	Identified behavioral indicators of the employees for the appraisers in the construction organization to improve the work performance as well as for HRM Decisions.	Motivated behavior ,committed behavior ,satisfied behavior and loyal

[27]	studies how construction managers would like to get evaluated. Results indicate performance dimensions for construction managers.	Efficient resource utilization, Administrative and managerial efficiency, Technical efficiency, Record-keeping and documentation of experience, Ability to innovate and develop, Personal integrity, Ability to communicate and establish contacts, Discipline and adherence to company regulations and procedures, Honesty, Achievement of planned agreed objectives, Adherence to and achievement of Quality, Profitability,
[29]	emphasizes the requirement of individual abilities, motivation and goals to maintain the performance of an engineer in construction industry	Ability, motivation, satisfaction, feedback and supporting factors are technologies and working environment

Above literature review reveals that if HRM Practices are stronger, employee performance will be better. Effective performance appraisal is the base for effective performance management [32]. Performance management plays a significant role in success of an organisation or project. Literature indicated that performance could be measured based on the completed objectives and behaviour of the employees [9]. Identifying performance dimensions for particular project or particular task is easy when compared to whole organisations which consist of number of different projects with different nature. In such cases, it is necessary to prioritise the related common PDs for whole organisation [12]. Personnel performance appraisal practice in construction organizations is poor. This is associated with lack of clear performance measurement dimensions. The purpose of this paper is to identify personnel performance appraisal dimensions for construction organizations and validate them in Indian context.

III. RESEARCH METHODS

The study adopts mixed method approach to achieve the objective. Mixed method consists of qualitative and quantitative approach to achieve better outcomes and is used for validation of research results [17].

- As part of quantitative approach questionnaire survey is used as primary approach.
- In this study Semi-Structured interviews are used as part of the qualitative method to increase the robustness of the study. Appraisal forms and related documents from various organizations supplemented the data from interviews and survey.

A. DEVELOPMENT OF SURVEY INSTRUMENT

Critical review of literature yielded a list of PDs and they were scrutinized with the help of construction professionals in the context of Indian Construction Industry. Based on the scrutinized performance dimensions a questionnaire was

framed and content validity was done with the help of construction professionals and academicians.

The questionnaire had two sections; Section 1 covers general information about the respondents. Section 2 focuses on Performance Dimensions, where respondents had to respond to the importance of a dimension in the appraisal process. Likert scale was used to measure the importance. A Scale measuring 1 to 5 was used where, 1 indicated not important, 2- less important, 3- neutral 4-important and 5-very important. Pilot study was conducted to measure the reliability of the questionnaire. A total of 23 members participated in the pilot study. Based on the comments and suggestions received, the questionnaire was refined and finalized.

B. SAMPLING TECHNIQUE AND STUDY POPULATION

Quantitative approach used purposive sampling which was more feasible for the questionnaire survey. The goal was to reach as many construction professionals as possible from different organizations. Equation (1) is used to estimate the required sample size [12][18].

$$N = \frac{Z^2 * (p+q)}{e^2} \tag{1}$$

Where, N-Sample size, Z-1.96 at 95% confidence level, e-acceptable margin of error for proportion being estimated = 10%, p-estimated proportion of population that represent the characteristics, q= 1-p, The required sample size was calculated as 97 based on the above equation .

C. DATA ANALYSIS METHODS

Reliability test was conducted for the survey instrument by using Cronbach alpha. Reliability test ensures that survey instrument is adequate, clear and understood and responded by participants. Exploratory Factor analysis (EFA) is used to gain insight into the structure or underlying processes that explain a collection of variables. The term structure describes the relationships between latent variables and the measured variables [16]. This method has been adopted as it is a data reduction method. Additionally, semi-structured interviews were held with construction professionals from different organizations that have predefined experience. Semi-structured interview analysis was based on themes and gave prominence to the perception of interviewee towards the appraisal system and performance dimensions.

IV. RESULTS AND DISCUSSION

A. FACTOR ANALYSIS

Reliability test of survey instrument was carried out by using version SPSS 21. Cronbach alpha value was 0.96 indicating good reliability considering that the acceptable range is above 0.7 according to [16]. Questionnaire was administered through e-mails. A total of 528 questionnaires were administered. Out of 528 respondents, 141 responses were received; among which eight responses were discarded from analysis as they were incomplete. The response rate was 25% which is reasonable. Factor analysis was conducted for Kaiser-Meyer Olkin measure of sampling adequacy and Bartlett test of Sphericity were conducted to determine correlation among the factors [16].

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The KMO value varies between 0 and 1. If the value is above 0.7 then it is considered as highly reliable. If it is between 0.6 and 0.7, it is considered as acceptable. The minimum value suggested is 0.5 [2]. The results indicated KMO to be 0.885 which indicates that the sample is adequate, which is considered for the further analysis. The approximate of Chi-square value as shown in Table II which is significant and suitable for further study.

Table II KMO Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.885
Approx. Chi-Square	4533.254
Bartlett's Test of Sphericity df	1176
Sig.	.000

An initial analysis was conducted to obtain Eigenvalues using principle components analysis. Eigenvalues are used as deciding value as to whether to retain the factors or to discard the factors. SPSS tool uses Kaiser's criterion of retaining factors with eigenvalues greater than 1 [5]. Seven factors were retained with total 62.205% cumulative variance among 49 variables.

Rotation method was applied to the initial factors as the factors had many cross-loadings. Factors obtained after rotation is the most important part of the analysis. To interpret the results, a cut-off point on the factor loading was selected. The recommended value is 0.4 [30]. Table 2 below consists of factor loadings which are above 0.4 and are used for naming the variable into the group.

Table III Factor loadings

Performance Dimensions (Variables)	Factor loadings	% of Variance	Key Performance Dimensions
Knowledge about Project resources	0.416	13.877%	Technical skills
Technical skills	0.659		
Problem identification and resolving errors	0.624		
Knowledge about safety rules and regulations	0.692		
Knowledge about working standards	0.507		
Systematic at work	0.634		
Initiative	0.409		
Work distribution	0.702	13.045%	Communication and Knowledge
Interactive	0.519		
Verbal communication	0.457		
NonVerbal communication	0.684		
Questioning	0.609		
Listening	0.520		
Presentation skills	0.751		
Financial knowledge	0.666	3.982%	Reporting
Present Market scenario	0.521		
Timely responsiveness	0.423		
Observing	0.528		

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ability		12.312 %	Leadership skills
Reasoning	0.536		
Compatible	0.737		
Coordination	0.426		
Focusing on colleagues and labor problems	0.663		
Conflicts resolving skill	0.755		
Influencing skill	0.678		
Risk taking ability	0.571	8.921%	Self attributes
Team building Capacity	0.428		
Honest	0.634		
Loyal	0.742	5.920%	Interpersonal skills
Self-awareness	0.481		
Knowledge about domain	0.573		
Interdependency	0.601		
Situational Learning	0.533	4.55%	Availability
Outcome oriented	0.681		
Overtime work	0.608		
Leave usage	0.747	3.982%	Reporting
Attendance in meeting	0.596		
Reporting to Superiors	0.755		

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

After a detailed analysis, seven factors or dimensions were obtained with a total variance of 62.205% which is acceptable [16]. Overall from 49 parameters 39 parameters which had above 0.4 loading and are grouped as a) Technical skills b) Communication and knowledge c) Leadership d) self attributes e) Interpersonal skills f) Availability g) Reporting

■ Technical Skills

Technical skills are one of the important competencies which an employee should possess, and it is directly linked to the performance evaluation. Knowledge about safety rules and regulations, buildings laws, working standards, methods, techniques are noteworthy. Especially these abilities indirectly help in organising the task, activities which would save rework, and increase productivity resulting in high performance. In construction work place Factor group 1 named as Technical skills consists of Performance dimensions namely Knowledge about Project resources (0.419), Technical Skills (0.663), Problem identification and resolving Noticing errors (0.613), Knowledge about safety rules and regulations (0.676), Knowledge about working standards (0.483), Systematic at work (0.620) adaptability (0.409) and work distribution (0.708). This factor explains a total variance of 13.877%.

■ Communication and knowledge

Communication involves exchange of information related to work by different modes among the employees, with the superiors and subordinates and clients.



Different modes of communication such as nonverbal communication, verbal communication mentioned in the study plays a major role to keep the employees updated in work. Communication helps in improving the performance of an employee if it is done in the right way, [7]. This group consists of performance dimensions being Interactive (.519), Nonverbal communication (0.684), Verbal communication (0.457), Questioning(0.609), Listening (0.520), Presentation skills (0.751), Financial Knowledge (0.666), Knowledge about present market scenario(0.521), Timely Responsiveness (0.423), Observing Ability(0.528), Reasoning(0.536), with the total variance of 13.045%.

▪ **Leadership skills**

A team executes construction projects consists of sub-teams [6]. Each team requires a person who can lead the teams. Effective leadership motivates the employees; improves the relationship between the employees and superiors. Leadership attributes have a direct effect on the employee outcomes such as satisfaction about the job and work outcomes. Performance appraisal depends on the leaders who are leading the team and they are the one distinguishes the successful performance from unsuccessful performance. This group indicates the attributes which an employee who is leading the teams should possess. This group consists of Compatible (0.737), Coordination (0.426), Focusing on colleagues and labour Problems (0.663), Conflicts Resolving skill (0.755), Influencing skills (0.678), Risk taking ability (0.571), and Team building Capacity (0.428) with the variance of 12.317%.

▪ **Self attributes**

The employees undergo a lot of challenges while executing projects such as emotional challenges and ethical challenges along with professional skills. Self attributes are important to sustain in the organisation. Self attributes are associated within the employees where they have to manage themselves. Knowing the strength and weakness of themselves helps to perform well in the job. The Performance dimensions in this group are honest (0.634), loyal (0.742) and Self-Awareness (0.481). This factor explains a total variance of 8.921%.

▪ **Interpersonal skills**

This group is named as interpersonal skills; some employees have tendency of depending on other employee's decision, or opinion for their action. Though construction works are interdependent, here the behaviour of employee has been discussed. In such cases, the work would be delayed and affects the other employees as well. It is better to identify such as cases if exists and the less interdependent ability would be better for employees. Approachable quality leads to build open communication between the employees, which is necessary; this would create a friendly atmosphere among the employees. One of the good qualities required among the employee is learning from the past mistakes. This group consists of knowledge about domain (0.573), Interdependency (0.601), Situational learning (0.533), Outcome oriented (0.681). This group explains the variance of 5.921%.

▪ **Availability:** The group named availability consists of Overtime work (.608), Leave usage (0.747), Attendance in meeting (0.596) accounting for variance of 4.55%.

▪ **Reporting:** Reporting to superiors (0.755) with variance of 3.982%. These factors f) and g) are not discussed in the study. It explains the least variance hence excluded [16].

B. SEMI-STRUCTURED INTERVIEWS

Semi-structured interviews focused on performance dimensions and various aspect of performance appraisal system in construction industry. Twelve Semi-Structured interviews were held among construction professionals working in different organisations. Personnel such as Project manager and Assistant General Manager, Design Engineer, Assistant Construction Manager, Junior engineer, Surveyor participated in the interview. The interview covered perception of both Appraisers and Appraisee's as well. The interviews lasted for 15 minutes to 45 minutes which was recorded and transcribed. Analysis of interview was based on themes.

According to one of the interviewee

“An employee gets evaluated based on the quantity of work done, total value of invoice generated, safety hrs, cost savings at his work, following schedule which helps revenue of the organizations. Other than personal attributes like employee attitude, client relationship, negotiation skills and adaptability these are the main factors which I see in an employee for his appraisal”

Interviewees mentioned that other than personal traits or attributes, employee get evaluated based on measurable dimensions such as Savings with respect to project cost or schedule, On Time Delivery, Cycle Time or Turn around, Delays, Personnel development. As per observation of appraisal forms and Performance dimensions could be categorized as Qualitative dimensions and Quantitative dimensions [12]. Interview extract indicated that quantitative dimensions were emphasised in the organizations.

This study has considered two key performance dimensions and balancing these two dimensions is one of the important aspects of an appraisal system in an organization. Interview results stated under these two themes as mentioned below

▪ **Qualitative dimensions** are the dimensions measured based on the observation, interaction, which cannot be measured in numbers. The obtained dimensions were same as the survey findings, in addition to that Adaptability, Customer/Client relations, Monitoring, punctual, Innovation, Creativity, negotiation skills Decision making, managing Subcontractors, attitude of an employee Initiative, Team building were mentioned by the interviewees.

▪ **Quantitative Dimensions** are the dimensions measured based on the basis of numbers or quantity of work done. This dimension consists of Quantity of work Done, Financial parameters such as Revenue generation, Total value of invoice generated, Number of drawings / deliverables, Savings with respect to project cost or schedule, On time delivery, Cycle time Or Turn around, Time delays, Personnel development, Late working hours, Safety man hours,

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Number of projects handled, Experience, Qualification, Attendance/leave were mentioned by the interviewees. The interviewee have emphasized that these dimensions are generally being used for the Appraisal of employees in the construction industry.

V. LIMITATION AND FUTURE SCOPE

The data was collected personnel from construction organizations. It represents their views. Further, PDs would be assessed for its appropriateness and validated for practical application with construction organizations and to identify the performance dimensions particular to construction organisations.

VI. CONCLUSION

PPA system is considered as a formal process and has become an integral part of an organisation to motivate the employees, improve them and increase the organisation performance. Job performance refers to skills, competencies that applied to a task to accomplish the organizational goals. Social conditions, cultural, demographic conditions and work environment, influences job performance. Due to fragmented nature of CI performance management is considered to be poor. Construction organizations may follow formal or informal system, employer or appraisers have criteria to evaluate the employees i.e. performance dimensions to evaluate the employees. Change in work practice and technology, demands the need for performance dimensions in the current context of the construction industry hence revising or reconsidering the performance dimensions have to be done periodically. In this study quantitative analysis has resulted in 7 Key performance dimensions. The qualitative dimensions identified through interviews can be mapped to the quantitative results; it signifies the importance of the 7 Key performance dimensions. In addition, it was observed that interviewees emphasised more on quantitative measures rather than qualitative measures. That indicated the cost conscious nature of construction organizations. Balancing these two dimensions is one of the crucial aspects of the appraisal system in an organization. This research identified the PDs, which is an initial step in increasing the effectiveness of the PPA system. This study would help HRM Department and appraisers in CI and strengthen the PPA system in construction industry

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