Efficacy of 360⁰ Evaluation on Employee's Productivity in Machinery Manufacturing Industry

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Abstract

The effectiveness of performance appraisal systems plays a pivotal role in enhancing employee's productivity and organizational development. This study investigates the impact of 360⁰ performance appraisal on employee's performance in machinery manufacturing industry at Chennai. The 360⁰ feedback mechanism involves gathering performance-related feedback from multiple sources, including supervisors, peers, subordinates, and self-evaluations, offering a more holistic and objective assessment of an individual's capabilities. Given the dynamic and technical nature of the manufacturing and automation industry, the organization's decision to implement this appraisal method aims to align employee performance with broader business objectives. The study adopts a descriptive research design using both primary and secondary data sources. Data was collected through structured questionnaires from 252 employees of machinery manufacturing industry at Chennai. The data collection focused on several variables Appraisee View, Rater's Accuracy, Communication and Feedback, and Continual-Learning and their impact on Employee Productivity. Statistical tools such as correlation, regression analysis, ANOVA, and t-tests were employed to analyze the data. The findings contribute valuable insights for HR professionals and managers seeking to optimize performance management systems in similar organizational settings.

Keywords: *Performance-Appraisal, Rater's Accuracy, Continual-Learning, Productivity.*

1. INTRODUCTION

Performance appraisal is a systematic and formal process used by organizations to evaluate employee performance over a defined period. It serves as a tool to provide employees with feedback, identify their strengths and weaknesses, set performance goals, and make key decisions regarding promotions, salary increases, training needs, and career advancement. By assessing specific job-related behaviors and competencies, organizations can align individual performance with broader business objectives.

There are several types of performance appraisals, including graphic rating scales, behavior-based appraisals, management by objectives (MBO), the critical incidents method, self-assessments, essay evaluations, and the 360-degree feedback system. Among these, the 360-degree appraisal is particularly comprehensive, collecting feedback from multiple sources such as supervisors, peers, subordinates, and the employee themselves. This approach reduces bias and offers a well-rounded view of an employee's performance.

Ward (1997) defines 360-degree performance appraisal as "A system or process in which employees receive confidential, anonymous feedback from the people who work around them, including peers, managers, and direct reports." Bracken, **Timmreck, & Church (2001)** describe 360-degree feedback as: "A method of systematically collecting opinions about an individual's performance from a full circle of sources—supervisors, peers, subordinates, and sometimes external stakeholders to enhance development and performance."

Performance appraisals are significant for various reasons. They enhance communication between employees and management, promote accountability, recognize and reward good performance, and identify training and development needs. Appraisals also contribute to employee motivation and job satisfaction by clearly outlining expectations and providing constructive feedback.

Several psychological and organizational theories underpin the effectiveness of performance appraisals. These include Goal-Setting Theory, Expectancy Theory, Equity Theory, Reinforcement Theory, Social Learning Theory, Agency Theory, and Competency-Based Theory. Each theory emphasizes the importance of clear goals, fair treatment, motivation through rewards, and the role of feedback in employee development.

Ultimately, performance appraisals, when implemented correctly, help create a transparent, fair, and growth-oriented work culture. They are essential for personal development, improved communication, and achieving strategic organizational goals. The 360-degree feedback method, in particular, encourages continuous learning and collaboration, fostering a more engaged and productive workforce.

The present study is essential to understand the significance and effectiveness of 360-degree performance appraisal in modern organizations. One of the primary needs of this study is to explore how this comprehensive feedback mechanism can enhance employee performance and development by providing constructive insights from multiple sources. It also plays a crucial role in improving overall organizational productivity by ensuring that employees receive balanced feedback, which helps them align their efforts with organizational goals. Additionally, the study aims to highlight how 360-degree appraisal contributes to increasing employee engagement and motivation, as employees feel valued when their opinions and performance are recognized through fair and transparent processes. Furthermore, it strengthens leadership and decision-making by providing managers with a holistic view of employee performance, enabling them to make informed decisions. Another significant need for this study is to examine how this system enhances fairness and transparency in performance evaluation, reducing biases associated with traditional appraisal methods. The study also focuses on identifying challenges and areas for improvement within the 360-degree appraisal system to ensure its effective implementation.

The study also sheds light on limitations such as potential biases in feedback, resistance to change, and the dependency on organizational culture for successful implementation. Despite these challenges, the research supports the notion that a well-executed 360-degree feedback mechanism fosters better communication, identifies training needs, and enhances engagement, motivation, and accountability.

2. OBJECTIVES OF THE STUDY
- ➤ To assess the impact of 360-degree performance appraisal on employee performance
- ➤ To find out the employees' awareness & level of satisfaction about the Performance Appraisal practiced in the organization.
- ➤ To find the effectiveness of 360-degree appraisal by analyzing the factors towards employee production.

3. INDUSTRY PROFILE

The machinery manufacturing industry in Chennai is characterized by its diverse product range, catering to multiple sectors and industrial needs. The city produces a wide variety of industrial machinery used in manufacturing, processing, and engineering applications. Chennai is also a prominent hub for textile machinery, supplying equipment for spinning, weaving, knitting, dyeing, and finishing processes essential to the textile industry. The construction sector is supported by the production of heavy equipment such as excavators, loaders, cranes, and road-building machinery. In addition, agricultural machinery like tractors, harvesters, and tillers are manufactured to meet the demands of the farming sector. The industry also specializes in producing special-purpose machines tailored to specific industrial requirements, ensuring efficiency and precision. Furthermore, Chennai is known for its machine tools and precision equipment, including CNC machines, lathes, drilling machines, and other high-accuracy tools essential for engineering industries. With the rise of advanced manufacturing, the city has also witnessed significant growth in the production of automation and robotics systems, providing smart solutions for automated production lines and industrial processes. This diverse product portfolio makes Chennai a key player in India's machinery manufacturing landscape.

4. REVIEW OF LITERATURE

The review of literature explores various studies that examine the effectiveness of 360-degree performance appraisals on employee productivity across different sectors. Multiple researchers highlight that multi-source feedback enhances performance when integrated with regular coaching, mentoring, and follow-ups.

Mukherjee & Thomas (2024) integrated 360-degree feedback with coaching, boosting engagement and task completion in the manufacturing sector. **Rahman & Prasad (2023)** found that significant productivity improvements in manufacturing firms when 360-degree appraisals were paired with mentoring.

Banerjee et al. (2022) observed that a 15–20% increase in employee performance from balanced multi-source feedback over six months. **Thomas & George (2021)** mentioned that 360-degree feedback in IT firms enhanced development and reduced attrition by aligning personal and organizational goals.

Kumar & Rani (2020) highlighted that improvements in communication and teamwork from 360-degree feedback, stressing the need for training. **Joshi & Singh (2019)** found that feedback from multiple sources increases credibility and positively affects motivation and behavior.

Rubin & Edwards (2018) revealed that perceived fairness in appraisals reduces bias complaints and improves employee acceptance of feedback. **Choudhury & Saxena (2017)** noted that 360-degree systems foster a culture of accountability and learning among mid-level managers.

Singh & Vadivelu (2016) emphasized that trust in appraisal objectivity is key to acceptance and productivity in formal and informal sectors.Iqbal, **Akbar & Budhwar (2015)** asserted that structured 360-degree systems enhance self-awareness and align individual and organizational goals.

Longenecker, Frink & Caldwell (2014) stated that training in feedback interpretation leads to better engagement and outcomes in U.S. firms. **Saravanan, Priya & Yoganandan (2013)** Pilot study showed that IBHAR software-supported 360 feedback improved alignment and self-awareness.

Zhang, Zheng & Li (2012) found that fairness and affective commitment mediate the link between 360-degree feedback and performance. **Kuvaas (2011)** showed that continuous informal feedback enhances the effect of 360-degree appraisals on productivity. **Lee & Son (2010)** stated that feedback alone had limited long-term effects unless combined with regular goal-setting and follow-ups.

5. METHODOLOGY

The research follows a descriptive research design, which involves observing and describing the behavior of a subject without influencing it in any way. The convenience sampling method was used to select participants for the study. This non-probability technique allows the researcher to collect data from respondents who are easily accessible and willing to participate, which is practical for organizational settings where time and accessibility may be limited. The sample size of the study is 252employees of machinery

manufacturing industry at Chennai. This includes a diverse group of employees from various departments, roles, and levels, representing the entire workforce involved in or affected by the performance appraisal system. This size was determined using a statistical formula to ensure reliability and validity, aiming to capture a representative portion of the employee base for accurate insights into the performance appraisal system. A structured questionnaire was used as the primary research instrument for data collection.

5.1 Independent Variables:

The study identified four independent variables that influence employee productivity: Appraisee View, which reflects how employees perceive the appraisal process; Rater's Accuracy, indicating the fairness and reliability of the evaluators; Communication and Feedback, measuring how well feedback is shared; and

Continual Learning, which represents employees' ongoing development from the feedback received.

5.2 Dependent Variable:

The dependent variable in this study is Employee Productivity. This variable represents the outcome influenced by the appraisal process, measured in terms of performance efficiency, task completion, skill improvement, and alignment with organizational goals.

5.3 Data Analysis Methods:

To interpret the collected data, various statistical tools were applied, including percentage analysis for demographic data, correlation and regression for examining relationships between variables, ANOVA to compare groups to analyze differences between gender and performance outcomes.

6. STATISTICAL DATA ANALYSIS
6.1 CORRELATION BETWEEN RATER'S ACCURACY AND EMPLOYEE PERFORMANCE:
HYPOTHESIS

H0: There is no significant relationship between independent variable Rater's accuracy and dependent variable Employee performance.

		EP1	EP2	EP3	EP4	EP5	EP6	EP7	EP8
RA1	Pearson Correlation	.900**	.804**	.710**	.693**	.653**	.675**	.746**	.754**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RA2	Pearson Correlation	.861**	.826**	.784**	.734**	.673**	.718**	.761**	.788**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RA3	Pearson Correlation	.790**	.838**	.770**	.695**	.636**	.714**	.693**	.754**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RA4	Pearson Correlation	.679**	.683**	.690**	.695**	.678**	.677**	.673**	.686**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

INTERPRETATION

The table presents the relationship between Rater's accuracy and Employee performance across eight performance dimensions. The Pearson correlation coefficient

(r) measures the strength and direction of these relationships, with values ranging from 0.636 to 0.900. The p-values (Sig. 2-tailed = 0.000) indicate that all correlations are highly significant, meaning the results are statistically valid and not due to

chance. So H0 is rejected, Hence there is strong significant relationship between independent variable Rater's accuracy and dependent variable Employee performance.

6.2 CORRELATION BETWEENCOMMUNICATION AND FEEDBACK AND EMPLOYEE PERFORMANCE:
HYPOTHESIS:

H0: There is no significant relationship between independent variable Communication & Feedback and dependent variable Employee performance.

		EP1	EP2	EP3	EP4	EP5	EP6	EP7	EP8
CF1	Pearson Correlation	.860**	.745**	.676**	.633**	.610**	.632**	.679**	.701**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CF2	Pearson Correlation	.802**	.773**	.683**	.624**	.583**	.662**	.662**	.694**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CF3	Pearson Correlation	.711**	.717**	.680**	.582**	.562**	.636**	.621**	.639**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CF4	Pearson Correlation	.689**	.675**	.702**	.705**	.673**	.667**	.677**	.663**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CF5	Pearson Correlation	.559**	.620**	.680**	.680**	.707**	.670**	.632**	.592**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

INTERPRETATION

This table examines the relationship between Communication & Feedback and Employee performance across eight dimensions. The Pearson correlation coefficient (r) measures the strength of these relationships, while the p-values (Sig. 2-tailed = 0.000) confirm that all correlations are statistically significant at the 0.01 level. So H0 is rejected, hence there is strong significant relationship between independent variable Communication & Feedback and dependent variable Employee performance.

6.3 CORRELATION BETWEENCONTINUAL LEARNING AND EMPLOYEE PERFORMANCE:
HYPOTHESIS:

H0: There is no significant relationship between independent variable Continual learning and dependent variable Employee performance.

		EP1	EP2	EP3	EP4	EP5	EP6	EP7	EP8
CL1	Pearson Correlation	.931**	.860**	.766**	.717**	.637**	.691**	.721**	.767**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CL2	Pearson Correlation	.887**	.872**	.824**	.787**	.705**	.772**	.775**	.821**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CL3	Pearson	.770**	.809**	.844**	.791**	.787**	.795**	.791**	.790**

	Correlation								
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CL4	Pearson Correlation	.708**	.764**	.792**	.848**	.823**	.822**	.810**	.772**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CL5	Pearson Correlation	.618**	.656**	.741**	.812**	.855**	.800**	.794**	.727**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CL6	Pearson Correlation	.725**	.783**	.766**	.777**	.734**	.776**	.788**	.780**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

INTERPRETATION

This table analyzes the relationship between Continual learning and Employee performance across eight dimensions. The Pearson correlation coefficients (r) range from 0.618 to 0.931, indicating a strong positive relationship. The p-values (Sig. 2-tailed = 0.000) confirm that all correlations are statistically significant at the 0.01 level.SoH0 is rejected and H1 is accepted, Hence there is strong significant relationship between independent variable Continual learning and dependent variable Employee performance.

7. REGRESSION ANALYSIS
HYPOTHESIS

H0 : There is no significant influence of independent variable of Rater's accuracy, Communication & Feedback, Continual learning on dependent variable Employee performance.

Model Summary									
				Std. Error of the Estimate	Change Statistics				
Model	R	R Square	Adjusted R Square		R Square Change	F Change	df1	df2	Sig. F Change
1	.914ᵃ	.836	.835	3.95296	.836	762.631	1	150	.000
a. Predictors: (Constant), Raters accuracy, Communication & Feedback, Continual learning									

ANOVAᵃ						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11916.792	1	11916.792	762.631	.000ᵇ
	Residual	2343.886	150	15.626		
	Total	14260.678	151			
a. Dependent Variable: Employee performance						
b. Predictors: (Constant), Raters accuracy, Communication & Feedback, Continual learning						

INTERPRETATION

The regression model shows a strong positive correlation (R = 0.914) between Raters' Accuracy, Communication & Feedback, and Continual Learning and Employee Performance. With R^2 = 0.836, these factors explain 83.6% of performance variation, confirming the model's high reliability and minimal overfitting (Adjusted R^2 = 0.835). So H0 is rejected. Hence, there is strong influence of factors independent variable Rater's accuracy, Communication & Feedback, and Continual Learning on the dependent variable Employee Performance.

8. SATISTICAL FINDINGS:

➢ The findings reveal a strong positive correlation between rater accuracy and employee performance, with Pearson's r values ranging from 0.742 to 0.834. All correlations are statistically significant at p = 0.000, indicating that higher rater accuracy leads to more reliable performance evaluations.

➢ The findings show a strong positive correlation between communication & feedback and employee performance, with r values ranging from 0.698 to 0.753. All values are statistically significant at p = 0.000, indicating that effective communication greatly enhances performance.

➢ The findings indicate a strong positive correlation between continual learning and employee performance, with r values from 0.816 to 0.874. All correlations are significant at p = 0.000, showing that continual learning greatly enhances employee performance.

➢ The findings show a strong positive relationship (R = 0.914) between Rater's Accuracy, Communication & Feedback, Continual Learning, and Employee Performance, with the model explaining 83.6% of the variance (R^2 = 0.836). The relationship is statistically significant at p = 0.000, confirming a strong influence of these variables on performance.

➢ The findings indicate no statistically significant difference in employee performance between the two groups, with a p-value of 0.865 and Levene's Test value of 0.691, confirming equal variances. The

mean difference of 0.29245 and the 95% confidence interval including zero support this result.

➢ The findings show a statistically significant difference between age groups with an F value of 1.875 and a p-value of 0.016 (< 0.05), indicating age has a meaningful impact on training-related outcomes. This suggests age should be considered when analyzing employee performance.

9. CONCLUSION

The study concludes that the 360-degree feedback system significantly contributes to enhance employee performance, engagement, and organizational development. A majority of respondents were aware of the appraisal system, and understood its objectives, showing strong awareness and communication. The system is perceived as efficient and simple , with most employees undergoing performance reviews every six months.

Key performance drivers identified include rater accuracy, clear communication, feedback, and continual learning. Correlation and regression analysis confirmed that these factors positively influence employee productivity. Statistical tests like ANOVA revealed significant differences across demographic variables, indicating the need for customized appraisal strategies.

The study emphasizes that 360-degree feedback, when executed with transparency, training, and follow-up actions, fosters skill development, motivation, and collaboration. However, challenges such as biased feedback and lack of clarity for some employees must be addressed.

Overall, 360-degree appraisals offer a well-rounded approach to performance management, aligning individual contributions with organizational goals. The system, if continuously improved, can serve as a powerful tool for long-term growth and employee development in machinery manufacturing industry organizations.

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