

**Analysis of Performance Appraisal Systems - An Empirical Evidence of Manufacturing  
Sector in Punjab**

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**Abstract**

India has witnessed an imbalanced industrial growth across different states in the past. Punjab as a state has suffered a lot due to policy induced barriers and constrained private sector initiatives through allocation of licenses and public sector investments in the industrial sector of its economy. Efforts of the subsequent governments to boost industrialization in Punjab seem to have been patronized and in recent years national and international agencies like World Bank, CRISIL, Union Government and RBI have recognized the state as a place for investments. One of the significant factors contributing to pace of industrialization is human capital of a state. The study surveyed 65 officers about performance appraisal systems being implemented in manufacturing industries of Punjab. Factor analysis and ANOVA have been used for identifying dominant variables affecting performance appraisals and the industry having the most effective appraisal systems. The results of the study can undoubtedly assist managers in developing robust performance appraisal systems.

**Keywords:** Industrialization, Human Resource Development, Performance Appraisal, Effectiveness

## **Analysis of Performance Appraisal Systems - An Empirical Evidence of Manufacturing Sector in Punjab**

### **Section 1**

#### **Introduction**

Industrialization is a process of transition where social and economic changes tend to associate with technological innovation. It leads to the re-organization of an economy for the purpose of manufacturing (Sullivan and Sheffrin, 2003). Kuznets (1948) termed industrialization as the permanent growth of the proportion of the non-agricultural sectors within the national economy running with considerable increase of the total industrial production as well as with the spread of up-to-date technology. Hoffman (1958) stated that the manufacturing sector of an economy has always followed a uniform pattern irrespective of the location factors, factors of production, state of technology etc. Despite several policy mechanisms and instruments for mitigating these disparities, India has witnessed an imbalanced industrial growth across different states (Papola *et al*, 2011).

Industrial development in Punjab after independence took place in phases. Cycle-parts and hosiery industries were established in the fifties and in the sixties. With the culmination of green revolution, agriculture based industries like farm machinery manufacturing began to develop. Auto parts and electronic items industries saw a boom in seventies and during the eighties resource-based industries such as food processing, edible and non-edible oils, vanaspati and sugar came up in large numbers (<http://www.crrid.res.in/SDR%20Punjab%20Chapter%206.pdf> accessed on 24th April'14). Since Punjab's industrial economy is a grooming ground for small scale industries, therefore, external and domestic liberalization has put substantive constraint on this sector. Hence, small scale industry has received substantial protection and concessions during the import substitution regime (Mohan, 2002). Modernization, rationalization, balancing

equipment/rehabilitation etc. have remained seriously neglected despite the fact that these aspects of industrialization are highly important (Bhatia and Batra, 1992).

The growth process of an economy needs to be based on integrated development of citizens right from childhood and throughout life. Human Resource has been identified as one of the main pillars to support the exponential growth based on knowledge based and service based economy. Need of the hour is to develop the human skill levels to compete at the international arena. In pursuance to the above, it is envisaged to promote Human Resource Development (HRD) through 'knowledge generation', 'knowledge dissemination' and 'knowledge level evolution' of the citizens through educational, vocational, professional development and consultancy process. One of the significant HRD interventions contributing to employee development is performance appraisal system in an organization. There is no denying the fact that by reviewing the performance of the employees, the performance of the organization is managed. The Performance Appraisal System is a scientific system of eliciting feedback, benchmarking it, communicating it to the employee concerned with a view to bring about development. Till recently, performance appraisal system was seen as a authority of the manager to write about the performance of his subordinates. With changing times and accepted significance of HRD interventions, organizations today believe that every individual has a potential and the skills of an individual could be sharpened, developed and utilized for achieving organisational goals. Employees not only have the right to know how they are performing but also conduct a self-appraisal.

Further, performance appraisal is one of the human resource management (HRM) tools used to evaluate the job performance of employees (Dessler, 2011; Mondy et al. 2002; and Tompkins, 1995). Performance appraisal systems are one of the important constituents of the performance management which has a direct impact on organizational performance (Indradevi, 2012). In spite of existence of a number of appraisal systems, the perceived

fairness is the most important determinant of the applicability of these appraisal systems (Ranade & Kumar, 2011). Not only this, encouragement of participation of employees in the system, training to appraiser and appraisee, establishment of proper feedback system and linking of good performance with special increment, promotion and rewards are other ingredients of an effective performance appraisal system (Aruhansi 1992). More appraisal interviews between the appraiser and the appraisee should take place and special computer programs should be used in order to enable the efficient and accurate registration and evaluation of the information obtained during the appraisal (McHale, 2003). Greller (1998) concluded in his study that participation of the employee in the appraisal was influenced more by which manager conducted the review than the circumstances of the specific review. Modern appraisal systems like 360 degree appraisal should be implemented to achieve enhanced performance, derive accurate feedback leading to individualized development planning and clarity in performance expectations (Punia and Dahiya 2006). Jain and Jain (2014) in their study on Indian banks found that majority of managers believed that performance appraisal process has helped them to improve their job performance, competence development and their self-development. Moreover, the performance appraisal as a communication technique between supervisors and subordinates has been found to be more important than other uses of appraisal (Tyler, 1982). Sahu, Jena and Parida (2016) in their study conducted on 200 professionals in manufacturing industries confirmed that there is association between performance and management systems and organizational effectiveness. Further, there is distinct differentiation in involvement of different levels of management in performance management. Ayers (2015) concluded that employee alignment increases organizational performance whereas plan alignment does not. Furthermore, the overall quality of a performance appraisal program moderates the alignment and organizational performance relationship.

In light of the above mentioned facts, the study was conducted in the manufacturing industries in Punjab with the following objectives:

1. To identify the factors affecting performance appraisal systems in the selected industries
2. To identify the industries with most effective implementation of performance appraisal systems
3. To make recommendations for improved implementation of performance appraisal systems

The study has been divided into four sections. First section is introductory in nature. Second section discusses database and methodology followed by analysis of Performance appraisal systems in section III. Entire discussion is summed up in section IV.

## **Section 2**

### **DATABASE AND METHODOLOGY**

In order to obtain the first hand information with respect to performance appraisal systems, we randomly picked 16 units from four prominent manufacturing industries spread throughout Punjab namely Manufacture of grain mill products, starches and starch products ,Spinning, weaving and finishing of textiles, Manufacture of basic iron and steel and Manufacture of transport equipment n.e.c. A questionnaire was administered to five supervisor/officer/executive level employees in each of the selected units making the sample size 80 but despite our best efforts we were able to receive 65 duly filled questionnaires. The respondents were in age group of 25- 50 years and 28 out of 65 were females.

To find out the dominant variables affecting implementation of the performance appraisal systems, Exploratory Factor Analysis (EFA) technique is applied. Twenty three variables, selected after reviewing relevant literature, were included in questionnaire. Further, one -way ANOVA was applied in order to compare the effectiveness of performance appraisal systems in the selected industries. Adequacy of data was checked by applying

normalcy test. The data was calculated from independent populations. Further, the industry with the most effective implementation of appraisal systems was identified by applying post hoc tests viz. TukeyHSD assuming equal variances and Games Howell assuming unequal variances.

### Section 3

#### DATA ANALYSIS AND INTERETATION

For the purpose of analysis, 23 variables generally affecting the performance appraisal systems were included in questionnaire (annexure1). Two tests - Kaiser Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of approximation have been applied to check if factor analysis can be applied or not (table 1). The Kaiser- Meyer-Olkin test measure of sampling adequacy is a statistic that indicates proportion of variance in variables that might be caused by underlying factors. Values greater than 0.50 generally indicate that a factor analysis is useful with the data. If the value is less than 0.50, the results of factor analysis probably won't be very useful. Bartlett's test of sphericity tests the hypothesis that correlation matrix is an identity matrix, and indicate that variables are unrelated and therefore unsuitable for structure detection. Small values (as in this case  $0.00 < 0.05$ ) indicate that a factor analysis can be useful with the data. High value of Chi square with .000 significance level implies that correlation matrix is not an identity matrix which further reasserts that factor analysis is appropriate. Both these tests permit the use of factor analysis for data reduction in our case.

Table 1: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.566
Bartlett's Test of Sphericity	Approx. Chi-Square	592.704

	Df	253
	Sig.	0

It is evident from table 2 that seven factors exhibited an eigen value more than 1 and together these factors accounted for 71.78percent of total variance. The top seven factors revealed after extraction turned out to be comments from mentors or coaches (0.864), behaviourally anchored rating scales(0.861), evidence of project work(0.841), methods and approach used by employee(0.839), support for development(0.836), evidence of performance(0.759) and potential assessment criteria(0.755).

Table 2: Factor Analysis

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.997	26.074	26.074	5.997	26.074	26.074	3.883	16.883	16.883
2	2.897	12.598	38.672	2.897	12.598	38.672	2.938	12.776	29.659
3	2.11	9.172	47.844	2.11	9.172	47.844	2.599	11.299	40.958
4	1.695	7.371	55.215	1.695	7.371	55.215	2.047	8.9	49.859
5	1.477	6.423	61.638	1.477	6.423	61.638	1.763	7.664	57.523
6	1.264	5.498	67.136	1.264	5.498	67.136	1.691	7.354	64.877
7	1.069	4.649	71.785	1.069	4.649	71.785	1.589	6.908	71.785
8	0.934	4.061	75.846						
9	0.84	3.653	79.499						
10	0.696	3.025	82.524						
11	0.633	2.753	85.277						
12	0.572	2.486	87.763						
13	0.565	2.457	90.22						
14	0.452	1.966	92.185						
15	0.37	1.61	93.795						
16	0.325	1.413	95.209						
17	0.254	1.103	96.311						
18	0.207	0.902	97.213						
19	0.192	0.833	98.046						

20	0.16	0.698	98.744					
21	0.136	0.59	99.334					
22	0.1	0.436	99.77					
23	0.053	0.23	100					

Extraction Method: Principal Component Analysis.

Table 3 depicts the rotated factor loadings for each variable. The parameters loaded strongly are highlighted.

Table 3: Rotated Component Matrix (a)

	Component						
	1	2	3	4	5	6	7
perobj	<b>0.76</b>	0.225	0.069	0.101	-0.203	-0.049	0.106
ratapp	0.383	-0.045	0.275	<b>0.584</b>	0.087	0.07	-0.367
perfyf	0.413	-0.102	0.1	<b>0.631</b>	-0.063	-0.058	<b>0.404</b>
prowrk	0.011	0.066	-0.123	<b>0.885</b>	-0.08	0.044	0.171
comnts	0.303	-0.011	-0.259	<b>0.357</b>	-0.158	<b>0.743</b>	-0.041
emp	<b>0.773</b>	-0.003	0.065	0.063	0.084	0.202	0.119
metem	0.281	-0.049	0.037	0.156	0.062	-0.069	<b>0.851</b>
devssup	0.102	0.144	0.13	-0.116	0.072	<b>0.876</b>	-0.037
maiapp	0.19	<b>0.658</b>	-0.063	-0.134	0.064	<b>0.196</b>	-0.11
criinci	<b>0.659</b>	0.266	-0.074	0.192	<b>0.147</b>	0.08	0.111
selapp	0.47	0.4	-0.085	0.091	0.048	<b>0.217</b>	<b>0.291</b>
proskil	0.192	<b>0.71</b>	-0.104	0.16	0.183	<b>0.183</b>	<b>0.333</b>
measco	0.038	<b>0.72</b>	0.33	-0.195	-0.159	-0.101	0.109
fuassg	<b>0.712</b>	0.366	-0.087	0.002	-0.245	0.17	0.012
curper	<b>0.483</b>	0.156	0.075	0.133	-0.576	0.062	<b>0.359</b>
sucpng	0.443	<b>0.504</b>	<b>0.42</b>	0.094	-0.232	0.038	0.216
test	0.383	<b>0.632</b>	0.278	0.202	0.091	-0.082	0.045
trgreg	0.39	0.487	0.146	0.305	<b>0.221</b>	-0.317	-0.223
asscen	-0.09	0.199	<b>0.688</b>	0.138	<b>0.316</b>	0.153	0.063
degree	0.171	0.103	<b>0.718</b>	-0.02	-0.25	-0.028	0.113
bars	0.029	0.158	0.103	-0.041	<b>0.898</b>	0	0.129
mbo	0.238	0.062	<b>0.744</b>	-0.14	0.019	-0.079	0.103
appsys	0.389	-0.183	<b>0.651</b>	0.13	<b>0.324</b>	-0.082	-



								0.081
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Extraction Method: Principal Component Analysis.

a. Rotation converged in 15 iterations.

In order to compare the effectiveness of performance appraisal systems in selected manufacturing industries, one way ANOVA was applied. Data was checked for normality (table 4) and was found suitable. Table 5 depicts that mean values of various industries are comparable except Transport Equipment (3.65). Further, Starch industry has the most effective implementation of performance appraisal systems.

Table 4: Kolmogorov-Smirnov Test

		PerfApp
N		65
Normal Parametersa	Mean	4.5338
	Std. Deviation	0.75855
Most Extreme Differences	Absolute	0.168
	Positive	0.098
	Negative	-0.168
Kolmogorov-Smirnov Z		1.358
Asymp. Sig. (2-tailed)		0.05

a. Test distribution is Normal.

Table 5: Descriptive Statistics

	N	Mean	Std. Deviation
Starch	20	4.93	0.49
Spinning&Weaving	10	4.52	0.65
Basic Iron &Steel	20	4.81	0.35
Transport Equipment	15	3.65	0.84
Total	65	4.53	0.76

Table 6: One Way ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	16.241	3	5.414	16.042	.000
Within Groups	20.585	61	0.337		
Total	36.826	64			

Table 7: Post Hoc Tests

Multiple Comparisons							
Dependent Variable: PerfApp							
	(I) Industry	(J)	Mean	Std.	Sig.	95%	

		Industry	Difference (I-J)	Error		Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Starch	Spinning& Weaving	0.41	0.22499	0.27 3	-0.1843	1.0043
		Basic Iron &Steel	0.125	0.1837	0.90 4	-0.3602	0.6102
		Transport Equipment	1.27667*	0.19842	0	0.7526	1.8007
	Spinning& Weaving	Starch	-0.41	0.22499	0.27 3	-1.0043	0.1843
		Basic Iron &Steel	-0.285	0.22499	0.58 7	-0.8793	0.3093
		Transport Equipment	.86667*	0.23716	0.00 3	0.2403	1.4931
	Basic Iron &Steel	Starch	-0.125	0.1837	0.90 4	-0.6102	0.3602
		Spinning& Weaving	0.285	0.22499	0.58 7	-0.3093	0.8793
		Transport Equipment	1.15167*	0.19842	0	0.6276	1.6757
	Transport Equipment	Starch	-1.27667*	0.19842	0	-1.8007	-0.7526
		Spinning& Weaving	-.86667*	0.23716	0.00 3	-1.4931	-0.2403
		Basic Iron &Steel	-1.15167*	0.19842	0	-1.6757	-0.6276
Games-Howell	Starch	Spinning& Weaving	0.41	0.23361	0.33 3	-0.2676	1.0876
		Basic Iron &Steel	0.125	0.13486	0.79 1	-0.2389	0.4889
		Transport Equipment	1.27667*	0.24248	0	0.6009	1.9524
	Spinning& Weaving	Starch	-0.41	0.23361	0.33 3	-1.0876	0.2676
		Basic Iron &Steel	-0.285	0.22104	0.58 7	-0.9437	0.3737
		Transport Equipment	.86667*	0.29911	0.03 8	0.037	1.6963
	Basic Iron &Steel	Starch	-0.125	0.13486	0.79 1	-0.4889	0.2389
		Spinning& Weaving	0.285	0.22104	0.58 7	-0.3737	0.9437
		Transport Equipment	1.15167*	0.23039	0.00 1	0.4996	1.8037
	Transport Equipment	Starch	-1.27667*	0.24248	0	-1.9524	-0.6009
		Spinning& Weaving	-.86667*	0.29911	0.03 8	-1.6963	-0.037
		Basic Iron &Steel	-1.15167*	0.23039	0.00 1	-1.8037	-0.4996

\*The mean difference is significant at 0.05 level

Significant p value (.000) in table 6 shows that there is difference in effectiveness of performance appraisal systems being implemented in selected industries. In order to find out the industry which is significantly different in terms of effectiveness of performance appraisal, post hoc tests viz Tukey HSD (assuming equal variances) and Games Howell (assuming unequal variances) have been applied (table 7).

Table 7 clearly depicts Tukey HSD test results which show that Transport Equipment industry is significantly different from other industries in effectiveness of performance appraisal systems. Moreover, Games Howell test also revealed the same i.e. Transport Equipment industry has the least effective performance appraisal systems in Punjab. Hence it can be said with some certainty that Transport Equipment industry in Punjab needs to emphasize on improving the performance appraisal systems being implemented.

#### Section 4

### CONCLUSIONS AND RECOMMENDATIONS

In this study, performance appraisal systems being practiced in different manufacturing industries of Punjab are assessed. An effort has been made to identify the variables influencing implementation of performance appraisals and compare the effectiveness of implementation in selected industries. Seven most influencing factors were comments from mentors or coaches, behaviourally anchored rating scales, evidence of project work, methods and approach used by employee, support for development, evidence of performance and potential assessment criteria. Further, results have shown that the effectiveness of performance appraisal was significantly different in selected industries. Starch industry has the most effective implementation of performance appraisal systems and Transport Equipment industry came out to be the one needing improvement in appraisal process.

The operations in the organizations and structure of jobs are changing continuously and there is no doubt that these changes have implications for performance management. The type of performance appraisal system used in an organization depends on its purpose. It is therefore recommended that managers in the organizations think of adopting a blend of traditional and modern methods of evaluating the performance of employees. Various factors highlighted above should be considered in the appraisal process so that the primary objectives of appraisal viz authentic evaluation of performance, identifying the problem areas and subsequently training needs, recognition of efficient employees etc are achieved. Moreover, managers should ensure that performance appraisals are structured in such a way that mentors and coaches are being involved in the process so as to get an insight into competencies of individual employees. Not only this, while deciding on the parameters and dimensions for evaluation, performance of an employee on specific projects along with methods and approaches used should be recorded and considered. This may involve taking multi ratings which has its own implications. Hence managers need to design performance appraisal in accordance with the situation. Further, managers across various industries should make potential appraisal an integral part of performance appraisal which goes a long way in facilitating succession planning.

The study has significance for managers working in other manufacturing industries as the results can be considered while designing performance appraisal process. The study can be extended by comparing other sectors of economy with manufacturing sector.

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## ANNEXURE I

**Expanded name of the variables used as codes**

	Code	Variables
1	personal objective setting	Quality of personal objective setting for individual employees in your organization is excellent.
2	ratings by appraisers	Ratings by appraisers are sometimes seen as based on subjective judgments like “not upto the mark”.
3	evidence of performance	Evidence of performance is gathered throughout the year.
4	evidence of project work	Evidence from project work (extra assignments) are included in performance appraisal.
5	comments from mentors or coaches	Comments from mentors or coaches are included in performance appraisal.
6	employee’s personal efforts	Employee’s personal efforts to become more proficient in his/her assignment and to prepare for more responsibility are considered.
7	methods and approach used by employee	Comments on the methods and approach used by the employee in performing the job are evaluated.
8	support for development	Low performance is highlighted, but development support is also defined.
9	evaluation of appraisal system	The appraisal system is maintained by monitoring its operation through periodic evaluation.
10	critical incidences	The critical incidences during the performance of job are recorded.
11	careful selection of appraiser	Appraisers are selected carefully by using a representative sample of people most critical to the ratee and who had the greater opportunity to observe his or her performance.
12	potential assessment criteria	Potential assessment criteria are based mostly on an employee’s process skills.
13	measurement of potential in terms of competencies	Potential of the employees is measured in terms of the competencies required to achieve the target level of performance in a particular job or at a particular level in company.
14	potential for future assignments	The potential of employees for the future assignments is considered.
15	promotion based on current performance	The promotions are given on the basis of current performance and consideration is also given to the potential of employee.
16	succession planning	Management believes in developing suitable employee base for succession planning.

17	test, exercises for assessment of competencies	Tests and exercises, assignments are given to employees to assess their competencies and on the job behaviour and potential to take higher responsibilities.
18	identifying potential employees for promotion	Potential assessment identifies training needs, provide guidance on possible directions in which an individual's career might go, and indicate who has potential for promotion.
19	assessment centres	Assessment centres provide good opportunities for indicating the extent to which candidates match the culture of the organization.
20	360 degree appraisal	360-degree appraisal is effective in identifying and measuring interpersonal skills, customer satisfaction, and team-building skills.
21	behaviourally anchored rating scales	Behaviourally Anchored Rating Scales (BARS) method is a relatively new technique which combines the graphic rating scale and critical incidents method.
22	management by objectives	Management By Objectives (MBO) is to create empowered employees who have clarity of the roles and responsibilities expected from them and understand their objectives.
23	components of appraisal systems	Appraisal systems should include self-analysis, employee input into evaluations, feedback, and goal setting by workers.