

Key Performance Indicators for Public Private Partnership Projects in India

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Abstract : Public Private Partnership Projects (PPP) have become an important option in India. Though there are many problems faced, PPP's are still considered as an interesting option. To achieve maximum Value for Money, Key Performance Indicators can be viewed as an effective method. This article describes in detail the 7 Performance Packages and 44 Performance Indicators. Questionnaire survey was conducted online to get the ratings for each indicators separately. Likert Scale Technique was used to rank the indicator's. The responses so obtained were then put into SPSS software, where the mean, standard deviation and rank were obtained for each performance indicator.

Index Terms–KPI, Performance Packages, Performance Indicators, Key Performance Indicators.

I. INTRODUCTION

Indian economy is growing at a very fast rate. There is need for infrastructural development for developing countries. PPP has emerged as a viable option for this. The objective of PPP is to effectively transfer risk to the private partners, reducing public sector administrative costs, solving the problem of public sector budgeting constraints, providing higher quality public products and services, and saving time in delivering the projects. Even if many issues are encountered during the execution of PPP project, it still remains an attractive option for government as it gives good Value for Money (VFM), on-time completion and on-budget. To make the project successful Performance measurement and management plays a very important role to improve the PPP project and increased VFM. There are many sectors where PPP can be applied. In the 11th 5 year plan the investment sectors that are considered are rail, road, air, water supply, transport, electric power, telecommunications. 7 performance packages were created which had various performance indicators under them. These packages are further divided into performance indicators (PI's) which are 44 in number. The key performance indicators and also the performance indicators were decided based on the present situation in India in the construction sector, politics sectors, economic sector.

II. KEY PERFORMANCE INDICATORS

Key Performance Indicators are one of the factor which help in making the PPP project become successful and help work the project efficiently. KPI is the performance measurement tool in the construction industry. The construction industry KPI were first published in 1999, and are updated manually by the UK working group. This improvement target formed the basis for the national headline KPI's in the UK, which were designed to show how improvement would be demonstrated. These KPI's are now widely used within the construction industry to measure the performance of the project. For a PPP project to be successful it is important to keep a check on the performance of the project. If the desired PPP project is not able to fulfill its main moto then the PPP project is sure to undergo a failure. In order to avoid this, KPI can help us find out which are the highlighted fields in the project, to concentrate on those factors and work efficiently on it.

III. METHODOLOGY

3.1 Literature Review

In literature review different papers are studied for studying different success factors. Primary data from literature search, academic books, research papers and Journals are main sources used in this study. After all the survey and research work has done 44 performance indicators has found out and they are clubbed under 7 different Key Performance Indicators. This stage will be identifying research objectives and research needs, and will include a comprehensive review and background discussion of the topic to help define the methodology and final results.

3.2 Data collection (Part A)

The second stage consists of data collection (Part A) of various indicators which affects the implementation of PPP projects. This data collection is carried out from comprehensive literature survey, discussion with expert and various case studies from all over the world.

3.3 Preparation of Questionnaire Survey

The third stage consists of preparation of questionnaire survey form by compiling the factors and sending to respondents. The random sampling technique is used to select number of respondents. The questionnaire form is sent to the respondents by both the method online as well as offline. For online method the questionnaire form is created in Google forms and sent to the various respondents all over the world which are related to PPP projects. For offline method i.e. for direct respondents face to face interview is carried out and questionnaire form is filled.

3.4 Data collection (Part B)

The fourth stage consists of data collection (Part B) of questionnaire form from the respondents who responded to online forms.

3.5 Data Analysis

The fifth stage consists of analysis of data collected from various respondents. For data analysis the SPSS software was used in which descriptive statistical analysis is carried out. Then mean, rank, standard deviation and frequency for all factors were found out.

IV. PERFORMANCE PACKAGES

The performance packages were collected from various international journals, books, literature, internet and self-learning. The performance packages may differ from country to country. The performance packages in this article are related to the Indian economy. Following were the performance packages that were selected for the study.

- KPI₁ - Financial

The PI's in this package include those factors which are related to the PPP project financially. This package is further divided into 11 performance indicators.

- KPI₂ - Physical Parameters

In this package the physical conditions related to the project are included. Here 7 indicators are included.

- KPI₃ - Innovation

This package includes all the new techniques that can be used in a PPP project. 7 performance indicators come under this category.

- KPI₄ - Legislative

This package includes those factors which are related to the governance, political issues, laws etc. 3 performance indicators come under this group.

- KPI₅ - Labour

The factors which are related to the labours are included in this package. 5 indicators come under this category.

- KPI₆ - Management

All the managing activities or factors come under this package. 10 indicators come under this category.

- KPI₇ - Health and Safety

This package includes the indicators related to the safety and health of labours working on site. 3 performance indicators come under this category.

V. LIKERT SCALE TECHNIQUE

A Likert Scale was used to take the responses from the respondents. A Likert item is simply a statement that the respondent is asked to evaluate by giving it a quantitative value on any kind of subjective or objective dimension, with level of agreement/disagreement being the dimension most commonly used. Often five ordered response levels are used. In this article also 5 order response levels are used. The format of a typical five – level Likert item used for survey analysis is as follows:

1. Not Important
2. Less Important
3. Moderate
4. Important
5. Very Important

VI. MEAN SCORE RANKING TECHNIQUE

The questionnaire survey included a table ranking questions which asked the respondents to rank a list of choices according to its importance. In order to analyse these specific type of questions, the mean score ranking technique was used. Options were given rating scale numbers from 1 to 5 for use in calculations and statistical analysis. For example, for the level of importance ranking questions, not important was given a score of 1, and very important was given a score of 5. The mean score of each option in the question is then calculated by using the following formula: $MS = \sum (f \times s) / N$ where $1 \leq MS \leq 5$ Where s = score given to each factor by respondents, ranking from 1 - 5 f = Frequency of each rating for each option N = Total number of responses for that option.

VII. ONLINE QUESTIONNAIRE SURVEY

An online questionnaire was prepared using Google Forms. Experts in the field of PPP were sent the questionnaire online through google forms. The respondents were from national as well as international levels. The questionnaire was sent to about 145 experts in the field of PPP in different countries all around the world, of which 70 people respondent.

Table 7.1: List of KPI

KPI Package	Code	Performance Indicator
KPI ₁ - Financial	F1	Global financial crises
	F2	Favourable economic conditions
	F3	Demonetization
	F4	Inflation
	F5	Investing parties
	F6	Sound financial analysis
	F7	Safe investments
	F8	Insurance coverage
	F9	GST (India)
	F10	Stock and market conditions
KPI ₂ - Physical parameters	Pp1	Site conditions
	Pp2	Design complexity
	Pp3	Type of construction
	Pp4	Purpose of construction
	Pp5	Governments knowledge of PPP
	Pp6	Flexibility of project
	Pp7	Quality standards
KPI ₃ - Innovation	I1	Use of new technology
	I2	Creative financial packages
	I3	Use of Hi-tech instruments/machineries
	I4	Technology transfer
	I5	Employee training
	I6	Digitalising work
	I7	CCTV surveillance
KPI ₄ - Legislative	L1	Stable legal environment
	L2	Stable laws
	L3	Changing rules and regulations
KPI ₅ - Labour	La1	Wages of labour
	La2	Provident funds for labour
	La3	Skilled labours

	La4	Optimum salaries for
	La5	Good relationship amongst the workers
KPI ₆ - Management	M1	Stakeholders management
	M2	Management of activities on site
	M3	Cost management
	M4	Time management
	M5	Risk management
	M6	Management of resources
	M7	Safety management
	M8	Administrative management
	M9	Conflicts management
	M10	Transfer management
KPI ₇ - Health and safety	H1	Safety of labours on site
	H2	Predetermining risks
	H3	Undertaking free health check-ups for on-site workers

VIII. USE OF SPSS SOFTWARE

SPSS software was used to get the mean and standard deviation of the indicators by putting the scale given by the respondents to the indicators. SPSS Statistics is a software package used for logical batched and non-batched statistical analysis. Using Likert scale the number of responses for a particular indicator were calculated. Mean and standard deviation were calculated. After getting the values of means and std. deviation ranks were given to the indicators based on the mean value. The indicator having maximum mean value was given 1st rank, while the indicator having minimum value was given the last rank. For example, the mean value of the indicator F1 (Global financial crises) was calculated to be 3.8429 and std. deviation 0.84503, mean value of Pp4 (Purpose of construction) was 3.9149 and std. deviation 0.84687, similarly mean value of L3 (Changing rules and regulations) was 4.2143 and std. deviation 0.74001, for M6 (Management of resources) 4.3714 and std. deviation 0.68464, for I1 (Use of new technology) 3.9000 and std. deviation 0.80127, etc. in this way the mean and standard deviation for all the performance indicators were calculated, which thereby were given ranks.

IX. RESULTS AND DISCUSSIONS

For the selection of factors which are best for the implementation of PPP, the factors are ranked by using SPSS descriptive analysis. The result obtained from survey and the factors are arranged in their decreasing score. According to the mean value, ranking is given to each performance indicator. In the KPI list we see “Time management” indicator having mean value 4.6087 which is highest and the “Demonetisation” having mean value 3.3696 which is the lowest in the Performance Indicators list.

X. GROUPING OF SURVEY RESULTS

After calculating mean and ranking of the performance indicators, the selection of some indicators which are having mean value ≥ 4.000 is done. 19 performance indicators were considered to be most important for the performance of a PPP project which had their mean value ≥ 4 . Following is the table showing the important indicators having the mean value greater than 4.

Table 10.1: List of KPI Having Mean Value ≥ 4

Performance indicators	Mean	Std. deviation	Rank
Time management	4.6087	0.57651	1
Risk management	4.5870	0.61738	2
Quality standards	4.5111	0.62603	3
Cost management	4.4565	0.58525	4
Stable laws	4.4444	0.69267	5

Management of resources	4.4222	0.69048	6
Stable legal environment	4.3778	0.80591	7
Safety of labours on site	4.3478	0.67387	8
Favourable economic conditions	4.3261	0.59831	9
Skilled labours	4.2826	0.71997	10
Good relationship amongst the workers	4.2826	0.80727	11
Stakeholders management	4.2667	0.71985	12
Changing rules and regulations	4.2222	0.76541	13
Safety management	4.1739	0.70881	14
Investing parties	4.1522	0.75916	15
Management of activities	4.1333	0.72614	16
Predetermining risks	4.1087	0.73721	17
Sound financial analysis	4.0870	1.15135	18
Administrative management	4.0000	0.78881	19

XI. DISCUSSION ON FREQUENCY TABLE

Using SPSS descriptive statistics mode we analyze individual factor. We can calculate frequency, cumulative percent and by using charts we can interpret the data on the bar chart. Following table shows the frequency, cumulative percent for the Purpose Of Construction factor. In that we see 4 respondents selected Purpose of construction is Less important. Then 16 respondents said that Purpose Of Construction factor for the successful implementation of PPP is Moderately important. Likewise 32 respondents selected it as important and 18 selected it as very important. Y-axis represents percentage and X-axis ratings scheme. Likewise for all the factors individually bar charts and percentages are calculated.

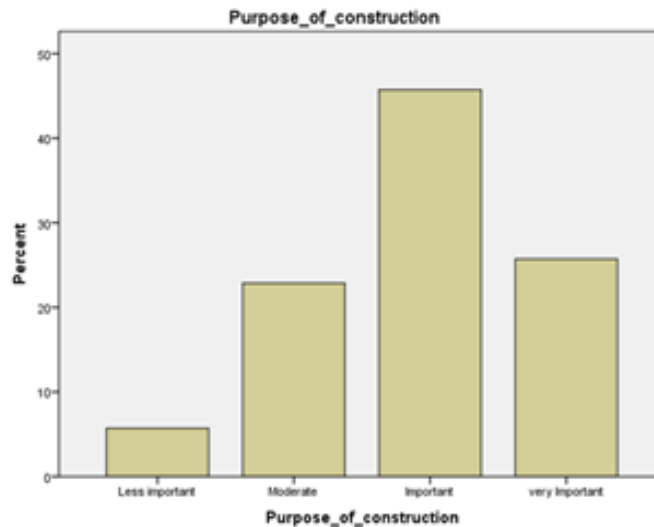
Table 11.1: List of KPI Having Mean Value ≥ 4

	Frequency	Percentage	Valid percent	Cumulative percent
Not important	0	0	0	0
Less important	4	5.7	5.7	5.7
Moderate	16	22.9	22.9	28.6
Important	32	45.7	45.7	74.3
Very important	18	25.7	25.7	100
Total	70	100.0	100.0	

XII. CONCLUDING REMARK

For the infrastructural development in the country various measures are being undertaken by the government. PPP is one such case. It is concluded that PPP is an effective way to deal with shortage of funding issues only by one party. Based on factors by using SPSS software Key Performance Indicators were analyzed. The present study examined the Key Performance Indicators for PPP implementation. The results indicate that all the performance indicators were rated properly and based on the results from the total respondents factors in the top rankings include Time management, Risk management, Quality standards, Cost management, Stable laws, Management of resources, Stable legal environment, Safety of labors on site, favourable economic conditions, Skilled labors, Good relationship amongst the workers, Stakeholders management, Changing rules & regulations, Safety management, Investing parties, Management of activities, Predetermining risks, Sound financial analysis, Administrative management.

Figure 12.1: Bar-chart Showing The Frequency of Responses



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