

# A Score Based Analysis of Key Performance Indicators in Manufacturing Industries

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*Abstract- The main purpose of this research is to identify the most accurate and timely decision of operations. The primary objective is to study and analyze the various categories of operations and its management and control. The scope of the study is to understand the operations of the company and support in delivering consistent quality to clients and also ensure to utilize the resources efficiently.*

*The research is carried out using the secondary data to bring about the opinion about the operations management of the organization. Data collection is done through analyzing the records, reports and journals of the company.*

*Scores are useful when comparing the measures whose cover a wide range. Scores give the clearance to the performance of each sector in a company.*

## I. INTRODUCTION

A Key Performance Indicators is used to find how company is achieving their objectives regarding their business. Company uses KPIs to evaluate their success to reach certain targets.

A good KPI is which gives clear information of progress towards an end goal.

When a KPI is created, it is already assigned a score. A score is a value between 0.0 and 1.0 representing the relative strength of the Actual Value.

The score is calculated on the basis of Actual value, best value and Worst value.

The limitations of using Key Performance Indicators are, it requires continuous monitoring and employees can be pushed too hard aiming specially for KPIs.

## II. OBJECTIVES OF THE STUDY

### PRIMARY OBJECTIVE:

- To construct a model for analysis of Key Performance Indicators.

### SECONDARY OBJECTIVES:

- To analyze the Key Performance Indicators based on
  - i. Quality.
  - ii. Finance.
  - iii. SDE.
  - iv. SDE Purchase.
  - v. Purchase.
  - vi. Program.
  - vii. Production.
  - viii. Team.
  - ix. Safety.
  - x. HR
  - xi. Logistics

- To classify the KPI used in the manufacturing company.
- To suggest a model for KPI analysis Centre-wise and Year-Wise.

## III. RESEARCH METHODOLOGY

The research design used here is Analytical Research. It uses facts or information already available, and analyze them to make a critical evaluation of the material. It involves the in-depth study and evaluation of available information in an attempt to explain complex phenomenon.

## IV. LIMITATIONS OF THE STUDY

- An enterprise data in its purest form might have errors.

- Missing information that may skew the key performance indicators (KPI) results.

## V. REVIEW OF LITERATURE

1. Key performance indicators score (KPIs-score) based on clinical and laboratorial parameters can establish benchmarks for internal quality control in an ART program

(Franco et al.2017) J.G. Petersen Conducted a study on Key performance indicators score (KPIs-score) based on clinical and laboratorial parameters. This paper was analyzed if a KPIs-score strategy with clinical and laboratorial parameters could be used to establish benchmarks for IQC in ART cycles. The purpose of this study was to develop a total KPIs-score (C-KPIs+L-KPIs) with the power to identify individual benchmarks, as well as to analyze the laboratory performance during different situations. The KPIs scores strategy application could result in an immediate evaluation of the patient's clinical and laboratory performance in the ART cycle. In addition, internal quality control benchmarks could be evaluated.

2. Performance Assessment of Construction Companies Integrating Key Performance Indicators and Data Envelopment Analysis

(Horta et al.2010) camanho conducted a study on Performance Assessment of Construction Companies Integrating Key Performance Indicators and Data Envelopment Analysis. This research aimed to fulfill the gap using data envelopment analysis (DEA) as a method to complement the information provided by a set of KPIs. The methodology proposed was useful to all organizations involved in benchmarking routines.

3. Analysis of Productivity based on KPI Case Study Automotive Paint Industry

(Paduloh et al. 2020) conducted a study on Analysis of Productivity based on KPI Case Study Automotive Paint Industry. *The research was aimed to measure and analyze productivity in production department at Paint Industry for Automotive, the criteria used are Quantity of production, number of sales, stock of raw materials, bad stock, electricity usage, loss production, machine breakdown, overtime hours, product stock productivity and Productivity of washing solvent usage.*

4. Key Performance Indicators for the Assessment of Pediatric Pharmacotherapeutic Guidance

(Barrett et al.2008) Patel Conducted a study on Key Performance Indicators for the Assessment of Pediatric Pharmacotherapeutic Guidance. The objectives were to construct key performance indicators (KPIs) for pediatric pharmacotherapy guidance to identify drugs where pharmacotherapy guidance would be most beneficial. A pilot survey to assess variation in caregiver appreciation for pediatric dosing guidance has also been constructed to provide a complementary subjective assessment.

5. Key Performance Indicators for Sustainable Manufacturing Evaluation in Cement Industry

(Amrina et al.2015) Vilsu conducted a study on Key Performance Indicators for Sustainable Manufacturing Evaluation in Cement Industry. This paper proposed a set of Key Performance Indicators (KPIs) for evaluating the sustainable manufacturing believed to be appropriate to the cement industry based on the triple bottom line of sustainability. The Analytical Hierarchy Process (AHP) method was applied to prioritize the performance indicators by summarizing the opinions of experts. It was hoped that the proposed KPIs enables and assists the cement industry to achieve the higher performance in sustainable manufacturing and so as to increase the competitiveness.

## VI. KPI EVALUATION

- For every KPI a target must be fixed.
- Weightages have to be given based on importance.

For Example:

KPI	WEIGHTAGE
1. Supplier PPM	3
2.No.Of. Incidents in QPF	3
3. Supplier Audit Assessment	3
4.Cost of Quality	4
5.Supplier Overall Performance Rating	3
6. Deploy e RFX Overall supplier Performance	3
7.Cost Reduction	5

7. LRR	3
9.Green Channel Parts	4
10.Supplier Delivery Performance	3
11.All Customer PPM	4
12. All Customer Incidents	4
13.In Process PPM	3
14.Labour Cost	5
15.Sourcing Process Class	2
16.Supplier Monitoring Class	2
17.Production Class	2
18.Logistics Class	2
19.Production Schedule Adherence	3
20.OEE	3
21.Operational Team Training	3
22.No.of.LTI (Last Time Incidents)	4
23.EOS	5
24.Suggestions	4
25.Customer Delivery Performance	3
26.Inventory Discrepancy	4
27.Stock Turn Ratio	4
28.Premium Freight as of Sales%	4
29.Quality Improvement Projects	3
30. Refresh Training to logistics	2
<b>TOTAL</b>	<b>100</b>

Table No: 1 –The Table showing the Weightages based on importance

- The target Scores can be allotted on a Scale (0-5).

For Example:

CENTRE	20-16	20-17	201-8	201-9	20-20	AVERAGE (A)	TARGET (B)	A/B* 100 (%)	RANK
Quality	7	5	11	19	19	12.2	26	46.9	6

KPI	SCALE
1. Cost Reduction	$\geq 100\% = 5, < 99\% \sim 80\% = 4, < 79\% \sim 50\% = 3, < 49\% = 0$
2. EOS	$> 85 = 5, 84 \sim 80 = 4, 79 \sim 75 = 3, 74 \sim 70 = 2$

Table No: 2 –The Table showing the target Scores allotted on a scale (0-5)

- A Score analysis can be done based on the actuals achieved the target Scores for each Centre.
- Based on Target and Actual achieved Variances could calculate for each KPI and Centre-wise Performance can be checked.

For Example:

KPI	2016	2017	2018	2019	2020
1.Customer Delivery Performance	2	3	2	3	2
2.Inventory Discrepancy	Nil	Nil	Nil	4	4
3.Stock Turn Ratio (STR)	4	4	4	4	4
4.Premium Freight	0	0	2	4	0
5.Refresh Training to Logistics	Nil	Nil	Nil	Nil	2
<b>ACTUAL SCORE</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>15</b>	<b>12</b>
<b>TARGET SCORE</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>

Table No: 3 –The Table showing the Score analysis based on Centre

- Year-Wise Comparison of Scores for different Centre can be done as shown and Ranks may be allotted.

For Example:

Finance	4	4	4	4	4	4	4	100	1
SDE	2	3	3	2	5	3	9	33.3	7
SDE Purchase	3	3	3	3	3	3	3	100	1
Purchase	5	6	5	7	10	6.6	11	60	2
Program	-	-	-	4	4	1.6	3	53.3	4
Producti -on	-	-	-	5	4	1.8	11	16.3	9
Team	-	-	-	-	3	0.6	3	20	8
Safety	-	-	-	4	4	1.6	8	20	8
HR	-	-	4	4	4	2.4	5	48	5
Logistics	6	7	8	15	12	9.6	17	56.4	3

Table No: 4 –The Table showing the Year – Wise KPI analysis based on Centre

CONCLUSION

Using Score analysis procedure,

- The best Centre may be identified each year.
- The Performance in each KPI in each Centre can be identified.
- Based on year-wise comparison, the Centre which are consistent in performance can be identified.

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