



## IJRTSM

### INTERNATIONAL JOURNAL OF RECENT TECHNOLOGY SCIENCE & MANAGEMENT

#### “METHODOLOGY AND APPLICATION OF PERFORMANCE OBJECTIVE PRODUCTIVITY (P.O.P) THROUGH ERGONOMICS APPROACH”

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#### ABSTRACT

*Occupational health and safety (O.H.S) fundamentally tries to keep up the working capacity of the work power just as to recognize ; survey and forestall dangers inside the workplace. Ergonomics , on the other hand, joins these mechanical creation through the plan of an improved work environment. O.H.S. furthermore, ergonomic applications along these lines cooperate to fulfill the necessities of charging neighborhood individuals' mentalities ; nearby work strategies as well as conventional methods of getting things done. It is along these lines significant for both remote and nearby speculators to examine working environments; to know how an apparatus; hardware and creation procedure would coordinate the neighborhood specialist's physical and mental capacity of the neighborhood populace O.H.S. furthermore, ergonomic issues are likewise related with the creation economy and social advancement; and hence; significant parts of gross household creation (G.D.P.) which are considered as contributions to the national economy through modern turn of events. It is along these lines imperative to realize what financial and modern techniques would be generally productive if O.H.S. what's more, ergonomic applications are to be actualized by and by. For practical working environment improvement ; this prompts powerful profitability levels through the proper degrees of laborers government assistance and occupation fulfillment which can be improved through the automation of creation exercises and ergonomics. In such manner ; work – related information is significant that would help modern business people from numerous points of view. They might be uncertain about whether they ought to obtain refreshed data in contributing their capital and apparatus as indicated by the nearby specialist's convention ; culture ; atmosphere ; work ; profile and the current format of work destinations, for example. Laborer's physical outstanding task at hand ; heat pressure and thermoregulatory related investigations were led yet those don't contain a wide range of exact information and ergonomic data. Anyway it is realize that work the board and profitability profile are not indistinguishable in all ventures.*

**Keyword:** GDP (gross household creation), OHS (Occupational health and safety)

#### I. INTRODUCTION

The general point of this article is to make a wellspring of business related data for various little – scale and medium – measured manufacturing plants , this will assist with recognizing conceivable future research open doors just as individual examination proper for such open doors in other mechanical units. It likewise considers some key issues with important business related writing that fill in as an asset; experts and others can profit by the contextual analyses remembered for this article. Consequently; general goals of the contextual investigations are to ; Give an exhaustive assessment of OHS and ergonomic issues in various work environments.

- Present ; screen and approve uniform systems for recording and investigation of work – related information and data.
- Investigate significant determinants of physical outstanding task at hand ( basic work act Musculoskeletal scatters ; heat pressure and so on.) ailment manifestations ; non-clean parameter ; psychosocial ; mediating and neighborhood components of move work.
- Clarify wellbeing , cleanliness ; Safety and ergonomic issues for supportable work environment improvement in little and medium – estimated endeavors where physical work (for example manual materials taking care of) is serious ; however it is common practice.
- Draw laborer's mindfulness and open consideration towards dangerous acts and conditions.

## II. METHODOLOGY AND APPLICATION FOR PRODUCTIVITY IMPROVEMENT

Word related wellbeing and security (O.H.S) basically tries to keep up the working capacity of the work power just as to distinguish ; evaluate and forestall dangers inside the workplace. Ergonomics , on the other hand, joins these mechanical creation through the plan of an improved working environment. O.H.S. what's more, ergonomic applications in this manner cooperate to fulfill the necessities of charging neighborhood individuals' perspectives ; nearby work strategies or potentially conventional methods of getting things done. It is hence significant for both remote and nearby financial specialists to explore work environments; to know how an apparatus; hardware and creation procedure would coordinate the neighborhood laborer's physical and mental capacity of the nearby populace O.H.S. furthermore, ergonomic issues are additionally related with the creation economy and social advancement; and in this way; significant parts of gross household creation (G.D.P.) For feasible working environment improvement ; this prompts compelling profitability levels through the fitting degrees of laborers government assistance and employment fulfillment which can be improved through the motorization of creation exercises and ergonomics.

In such manner ; work – related information is significant that would help modern business people from multiple points of view. They might be uncertain about whether they ought to secure refreshed data in contributing their capital and apparatus as indicated by the nearby laborer's convention ; culture ; atmosphere ; work ; profile and the current format of work destinations, for example. Specialist's physical remaining task at hand ; heat pressure and thermoregulatory related examinations were directed however those don't contain a wide range of observational information and ergonomic data. Anyway it is realize that work the board and efficiency profile are not indistinguishable in all enterprises. Let

U = the sub – system

V = the KPA

Y = the Performance Objectives

W = the Weightage factor

Oyvu = the performance Value of PO – y KPA – v in sub – system u

Oyvu = the Objectivated Output of PO – y KPA – v in sub – system u

Productivity Index PI of a system S , is arrived at as,

$$PI = \sum_{u=1}^n W_u (PI)_u \dots\dots\dots(i)$$

u= 1

where,

$$\sum_{u=1}^n W_u = 1,$$

u= 1

(PI)<sub>u</sub> the productivity Index of sub – system u is determined as,

$$(PI)_u = \sum_{v=1}^n \sum_{y=1}^m [W_{vu} (PI)_{vy}] \dots\dots\dots (ii)$$

Where,

$$\sum_{v=1}^n W_{vu} = 1, \text{ for all } u\text{'s.}$$

$(PI)_{vy}$ , the Productivity Index of key performance Area,  $v$  of sub- system  $u$  is given as,

$$(PI)_{vy} = \sum_{y=1}^m W_{vy} O_{vy} / (O^y_{vy}) \dots\dots\dots (iii)$$

$$\sum_{y=1}^m W_{vy} = 1, \text{ for all } u \text{ and } v$$

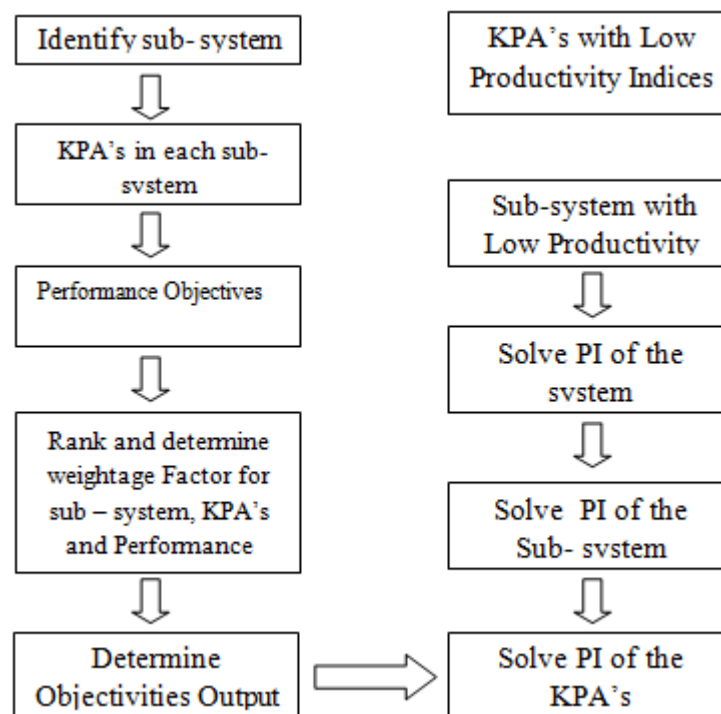
Substituting values of  $(PI)_{vy}$  from equation (iii) in equation (ii) Productivity Index  $(PI)_u$  of a sub-system  $u$  can be rewritten as.

$$(PI)_u = \sum_{v=1}^n \sum_{y=1}^m W_{vu} W_{vy} O_{vy} / O^y_{vy} \dots\dots\dots (iv)$$

Value of  $(PI)_u$  from equation (iv) can be substituted in equation (i) to provide PI, the Productivity Index of a system  $S$ , as

$$PI = \sum_{u=1}^n \sum_{v=1}^n \sum_{y=1}^m W_u W_{vu} W_{vy} O_{vy} / O^y_{vy} \dots\dots\dots (v)$$

### III. FLOW CHART FOR THE PROCESSES FOR USE OF PO-P APPROACH FOR PRODUCTIVITY MEASUREMENT:



### IV. IDENTIFICATION OF SUB-SYSTEMS:

The concerned little scope metal utensil producing industry can be considered to work as a framework with following sub – framework:

1. Creation sub-framework (A)
2. Innovation sub-framework (B)
  
3. Material sub-framework (C)
4. Objectives and qualities sub – framework (D)
5. Showcasing sub-framework (E)
6. Ergonomics sub-framework (F)

#### V. THE FOLLOWING KPA'S FALL UNDER CONSIDERED SUB-SYSTEMS:

SUB-SYSTEM	PERFORMANCE AREA (KPA)
1. Production sub-system (A)	1. Manpower Utilization
	2. Assets Utilization
	3. Quality of Production
2. Technology sub-system (B)	1. Design & Development
	2. R&D/ Innovation
3. material sub-system (c)	1. Storage Management
	2. Inventory control
4. Goals and value sub-system (D)	1. Employee Satisfaction
	2. Customer Satisfaction
	3. Social Goals
5. Marketing sub-system (E)	1. Sales
	1. Capability working
	2. others

#### 5.1 SUB-SYSTEMS WEIGHTAGE

A	Production	5	0.192	Production	5	0.208
B	Technology	5	0.192	Technology	5	0.208
C	Materials	1	0.038	-	-	-
D	Goals & Values	1	0.038	-	-	-
E	Marketing	10	0.384	Marketing	10	0.417
F	Ergonomics	4	0.153	Ergonomics	4	0.167
	TOTAL	26	1		24	1

#### Method of coupled comparison:

In this system , every goal is contrasted with each other goal and

SUB SYSTEM	PERFORMANCE	PERFORMANCE OBJECTIVE (PO)	RELATIVE WEIGHT OF PO's (by the method of direct scaling)	WEIGHT FACTOR	OBJECTIVE VALUE	ACTUAL VALUE
Production	1. Manpower utilization	1. direct labour utilization:	40	0.4	0.793	0.751
		2. Cost effectiveness: Standard hrs recovery	10	0.1	0.0448	0.0405
		3. Is the brick manufacturing unit uses locally available man.	50	0.5	1	0.8
			TOTAL = 100			
	2. Assets utilization	1. Capacity utilization: Standard hrs recovery/personal expenses	100	1	0.0448	0.0405
			TOTAL = 100			
	3. Quality of production	1. Index of defect free production: value of defect free production/value of total production	100	1	1	0.8
			TOTAL = 100			

Technology	1. Design & development	1. Is the brick manufacturing unit uses locally available low cost technology intangible scale (0-1)	30	0.4	1	0.8
		2. Are brick manufacturing unit aware of the locally available technologies intangible (scale 0-1)	30	0.3	0.7	0.6
		3. design, getting approved	10	0.1	0.4	0.3
		4. CAD facility ?	0	0	1	0
		5. Are there any traditional drafting practices after finalization of design intangible (scale 0-1)	10	0.1	1	0
		6. Are there any process of verification and validation of design intangible (scale 0-1)	5	0.05	0.1	0
		7. Is there a system to acquire and assimilate a new technology ? intangible (scale 0-1)	5	0.05	0.1	0
		TOTAL = 100				
	2. R&D / innovation	1. Has the gap analysis of the present and required science	10	0.1	0.1	0
		2. when key customer requirement are not met ?				

		intangible (scale 0-1) 3. does brick manufacture have quality manual ? intangible (scale 0-1) 4. does the brick manufacturing unit uses SWOT analysis from time to time for fixation of the future strategies ? Intangible (scale 0-1)	40  20  30  TOTAL = 100	0.4  0.2  0.3	0.4  0.1  0.1	0.3  0  0
Marketing	1. Sales	1. Sales absolute monetary intangible (scale 0-1) 2. Profitability profit/sales intangible (scale 0-1)	50  50 TOTAL = 100	0.5  0.5	38937600  0.166	38188800  0.166
	2. Marketing Research	1. flexibility to change production capability intangible (scale 0-1) 2. flexibility to cope up with varying demand intangible (scale 0-1) 3. are customers satisfied with the quality and price of the product ? intangible (scale 0-1)	30  40  30 TOTAL = 100	0.3  0.4  0.3	0.1  0.4  0.7	0  0.3  0.5
	3. Sales advancement	1. Do schemes of government and NGO help in creating demand for brick intangible (0-1) 2. Is there any group effort on behalf of manufactures to market their product ? intangible (scale 0-1) 3. Are brick exported ? intangible (scale 0-1) 4. Does government provide financial assistance for	30  40  0  30 TOTAL = 100	0.3  0.4  0  0	0.1  0.7  0.1  0.1	0  0.5  0  0
Ergonomics	1. Personal ,capability	1. experience required for the work up to mark 2. what is the level of interest among the workers	30	0.3	0.7	0.6

		to do the job ? 3. manpower properly trained to use the existing level of technology ?) 4. Do the workers, meet the adequate physical characteristics requirements	10  30  30  TOTAL = 100	0.1  0.3  0.3	0.4  0.7  0.7	0.3  0.6  0.6
	2. Working condition	1. facilities properly laid out to assist the worker in doing the work 2. tools upto date 3. environment around the work 4. Is the work load properly distributed among the workers ? intangible (scale -1)	30  20  20  30  TOTAL = 100	0.3  0.2  0.2  0.3	0.7  0.1  0.4  1	0.6  0  0.3  0.8
	3. other	1 any rules regulations and policies regarding the work culture  2. measures taken to overcome mental distraction  3. work schedule and rotation, among the workers properly carried out  4. workers subjected to unusual environmental stress	10  10  40  40  TOTAL = 100	0.1  0.1  0.4  0.4	0.4  0.1  1  0.7	0.3  0  0.9  0.6

## 5.2 WEIGHTAGE OF KPA'S (KEY Performance Areas)

### Method of Direct Scaling:

In this technique the weighing is done legitimately. The evaluators are approached to choose the overall load of every one of the subordinate components speaking to relative significance for the utility of the related component on the following of progressive system. The aggregate of the all out loads of all components is Identified as hundred.



## VI. RESULT AND ANALYSIS

### 6.1 ANALYSIS OF PERFORMANCE INDEX:

Sub –system	Weightage factor	KPA (Key Performance Activity)	Weightage factor	PI of KPA	PI of Sub-system
Production	0.208	Manpower Utilization	0.5	0.8692	
		Assets Utilization	0.3	0.9041	
		Quality of production	0.2	0.8000	
					0.8658
Marketing	0.417	Sales	0.4	0.9903	
		Market research	0.4	0.5143	
		Sales promotion & Publicity	0.2	0.2857	
					0.6590
Technology	0.208	Design & development	0.6	0.5721	
		R&D / Innovation	0.4	0.3000	
					0.4632
Ergonomics	0.167	Persona capability	0.4	0.8464	
		Working condition	0.3	0.6471	
		Other	0.3	0.7778	0.7660

Productivity Index of the system =  $(0.8658 \times 0.208) + (0.6590 \times 0.417) + (0.4362 \times 0.208) + (0.7660 \times 0.167) = \mathbf{0.6791}$

### 6.2 ANTICIPATED IMPROVEMENT

SI NO.	Sub systems	Questionnaire	Response old	Response (anticipated)	Objectivated (anticipated)	Actual (anticipated)
1	Production	1. Is the brick manufacturing unit uses locally available man power for its operations ?	Very Much	Very Much	1	0.8
2	Technology	1. Is the brick manufacturing unit uses locally available low cost technology.	Very much	Very much	1	0.8
		2. Are brick manufacturing unit aware of locally available technology ?	Largely	Very much	1	0.8
		3. Is the design getting approved before production run ?	Moderately	Largely	0.7	0.6

		4. Is there any CAD facility ?	Not at all	Not at all	0	0
		5. Are there any traditional drafting practices after finalization of design	Not at all	Not at all	0	0
		6. Are there any process of verification and validation of design ?	Not at all	Not at all	0.1	0
		7. Is there a system to acquire and assimilate a new technology ?	Not at all	Largely	0.7	0.6
	2. R&D /Innovation	1. Has the gap analysis of the present and required technology level done ?	Not at all	Moderately	0.4	0.3
		2. Does brick manufacture take Corrective action when key customer Requirement is not met ?	Moderately	Largely	0.7	0.5
		3. Does brick manufacturer have Quality manual ?	Not at all	Not at all	0.1	0
		4. Does the brick manufacturing Unit uses SWOT analysis from time to time for fixation of the future strategies ?	Not at all	Moderately	0.4	0.3
	Marketing					
	1. Market Research	1. Flexibility to change production capability ?	Not at all	Largely	0.7	0.6

**Anticipated****Productivity Index (PI)**

$$(0.8858*0.208) + (0.7638*0.417) + (0.6470*0.208) + (0.8739*0.167) = 0.7832$$

**RESULT**

The anticipated productivity index have increased from , 6791 to 7832

**VII. CONCLUSION & SUGGESTIONS**

The present level of proficiency is evaluated using method of productivity estimation named as execution Objective – gainfulness (PO-P). approach lays weight on the pieces of ID of regions with low benefit so as to accomplish improvement. Its central perspective lies in the conviction that input resources of an affiliation can't be found in imprisonment. A presentation targets and their weightage. To fuse execution objective of abstract nature's survey is used. For productivity estimation three sub – structure essentially 'Development', 'Workplace' and ' Market' has been recognized where improvement in productivity was required. For gainfulness enhancements, in the zone of 'Development' 'working condition' and 'Market factor', the Study looked at all of these sub – structure and thought of

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suggestions that updates proficiency of these on a very basic level. From an investigation of the heaters working in various bits of the Jharkhand state. I have a firm conviction that it is a great deal of possible to make these heaters 'CLEAN' to give amicable and sterile condition to the workers. The way is there , will is required. All The updates demonstrated above need be followed cautiously. It won't only result in all things considered saving of fuel anyway will moreover make the workplace clean. Minor interests in these undertakings will be more than reimbursed by the sound and clean biological that has so far got away from the square kilns. It is time square industry stops its old fashioned look of and pensive individual formed system and approaches as a dynamic and present day looking affiliation. The business should intentionally assist lawful bodies in state and national excitement to ensure the nature and condition in its rough structure to be available to the achievement. I believe the state government will adjust to the circumstance and react to the call of giving a 'Great' space to the workers in their broilers. I am convinced they will win in this earnest

effort. The ergonomic perspectives highlighted in this investigation work will remove the prosperity danger of the workers of the natural relics delivering and will give better strong conditions. In order to reduce musculoskeletal issue of the workers essential measures should be taken , as per the recommendations to re-structure workstations. With the upgrades in working position (considering ergonomic guidelines) , gainfulness levels will in like manner be improved. The new suggested working positions, diminishes loosening up settlement as well. This constructs the amount of influential man-day of work and from now on increases in productivity. The proposed present also diminishes to unfathomable degree the feebleness towards musculoskeletal

upsets (MSD) subsequently extending the amount of yield once can make during the work.

### REFERENCES

TEXT/REFERENCE BOOKS :		
NAME OF AUTHORS	TITLES OF THE BOOKS	NAME OF THE PUBLISHER
ADAMS TIME MANAGEMENT	MARSHALL COOKS	VIVA BOOKS
BASIC MANAGERIAL SKILLS FOR ALL	EH. MC GRATH S.I.	PRATICE HALL OF INDIA PVT. LTD.
BODY LANGUAGE	ALLEN PEASE	SUDHA PUBLICATIONS PVT. LTD.
CREATIVITY AND PROBLEM SOLVING	LOWE AND PHIL	KOGAN PAGE (I) P. LTD
DECISION MAKING & PROBLEM SOLVING	BY ADAIR , I	ORIENT LONGMAN
DEVELOP YOUR ASSERTIVENESS	BISHOP , SUE	KOGAN PAGE INDIA
MAKE EVERY MINUTE COUNT	MARION E HAYNES	KOGAN PAGE INDIA
ORGANIZATIONAL BEHAVIOR	STEVEN L MC SHANE AND MARY ANN GLINOW	TATA MC. GRAW HILL
ORGANIZATIONAL BEHAVIOR	STEPHEN P. ROBBINS	PRETICE HALL OF INDIA PVT LTD.
PRESENTATION SKILLS	MICHAEL HATTON (CANADA – INDIA PROJECT )	ISTE NEW DELHI
STRESS MANAGEMENT THROUGH YOGA AND MEDITATION		STERLING PUBLISHER PVT. LTD
TARGET SETTING AND GOAL ACHIEVEMENT	RICHARD HALE, PETER WHILOM	KOGAN PAGE INDIA
TIME MANAGEMENT	CHAKRAVARTY , AJANTA	RUPA AND COMPANY
WORKING IN TEAMS	HARDING HAM A	ORIENT LONGMAN

### INTERNET ASSISTANCE

1. [HTTP://WWW.MINDTOOLS.COM](http://www.mindtools.com)
2. [HTTP://WWW.STRESS.ORG](http://www.stress.org)
3. [HTTP://WWW.ETHICS.COM](http://www.ethics.com)
4. [HTTP://WWW.COOPCOMM.ORG/WORKBOOK.HTML](http://www.coopcomm.org/workbook.html)
5. [HTTP://WWW.MAPFORNONPROFITS.ORG](http://www.mapfornonprofits.org)