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INCREASE IN PER WORKER PRODUCTIVITY AND EFFICIENCY

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ABSTRACT

Productivity is the term which represents the degree of effectiveness of management in utilizing facilities for production. It is the measure of what output of goods and services is produced for a given amount of input resources viz. man, machine material and other infrastructure needed for it. High productivity means more production with some resource, or some amount is produced at less construction of input resources. Worker is converter and operator of other resources. His willingness, interest, and attitude plays great role in achieving higher productivity. To achieve higher productivity, along with high technological level, the contribution by all sections of the community i.e. by workers, employers and Govt. are necessary different management techniques such as time and motion, study, work study, inventory control.

Productivity and efficiency improvement is sought because it supports producing material goods or services lessens inflationary pressures on prices of these goods and services to consumers. Increase in wage and salary without raising unit labour costs and prices of

goods and services. It delivers higher standard of living, controls inflation and contributes to stronger national economy.

KEYWORDS: Productivity, Output, Input Technical Factors, Human Factors – Willingness, Interest, Attitude, Time and Motion, Study, Inventory Control

1. INTRODUCTION

Productivity has become an everyday watchword. It is crucial to the welfare of the Industrial Firm, the employees, the customers, the society as a whole so also it results in the industrial and economic growth of the country.

Productivity is the quality or state of being productive. It is some relationship of output to input. This concept guides the management of production system, and measures its success.

It is the quality that indicates how well labour, capital, materials infrastructures and energy are utilised to achieve higher productivity. The increase in productivity is looked upon as the key to prosperity at all levels. In its modern sense, it refers to the relationship between the result and the means employed. It is the ratio of what is produced to what is required to produce. High ratio means higher productivity or efficiency. It seeks to measure the economic soundness of the use of the means. Productivity will be higher when same amount of output is obtained with lesser means or when output is more with some amount of means.

DEFINITION OF PRODUCTIVITY -

Productivity is the quantitative relation between amount produced to amount of resources. ILO defines productivity as,

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}}$$

The concept of productivity implies effectiveness and efficiency of an individual



organizational performance. As per Management Guru, Peter Drucker. Effectiveness means utilising the resources for right purpose i.e. doing right things and efficiency means doing the things in right manner i.e. performing job with high accuracy going lower waste and high output with in prescribed time limit.

$$\text{Productivity index} = \frac{\text{Performance Achieved}}{\text{Resources Consumed}}$$

$$\text{Total Productivity index} = \frac{\text{Product} + \text{Service}}{\text{Labour} + \text{Material} + \text{Energy} + \text{Capital}}$$

A more general expression for Total Productivity Index. is

$$\text{Total Productivity index} = \frac{\text{Sales} + \text{Inventory Change} + \text{Plant}}{\text{Labour} + \text{Material} + \text{Service} + \text{Depreciation} + \text{Investment}}$$

It is in technical terms. But European Productivity Agency (EPA) has defined productivity taking into account the technical and human factor at work.

Productivity – It is an attitude of mind. It is an mentality of progress of constant improvement of that which exists. It is the certainty of being able to do better today than yesterday and continuously. It is constant adaptation of economic and social life to changing conditions. It is the continual effort to apply new techniques and methods. It is the faith in human progress. This definition is broader and covers different facets in its purview. In In this connection productivity is different for different people. Economists determine it from Gross National Product (GNP) and measure as output upon input in manufacturing process. Managers view it as cost cutting and speed up, engineers think it in terms of more output per hour for which capacity utilisation production per man hour, man power efficiency are observed seriously. Behavioral scientists view it as efficient labour utilisation, for that fitting proper man for proper work and human engineering i.e. ergonomics are studied.

II) OBJECTIVE OF THE STUDY:

- 1) To study the relation between technology and productivity.
- 2) To study the product based technique.
- 3) To study the task based technique.
- 4) To study the material based technique.
- 5) To study the employee based technique.

III) REVIEW OF LITERATURE:

Abundant literature is available about productivity in industrial engineering production management books.

S. L. Rao, President All India Management Association, New Delhi, in the forward of 12th National Conventions on Low Productivity and High Cost (1985) the Management challenge stated that – If industry is to be the engine of economic growth, and modernisation and competition the chosen paths for improving industrial efficiency then productivity improvements will be indicators of success.

Dr. H. S. Shan, Professor, Mechanical and Industrial Engineering Dept., University of Roorkee – in his book Work Study and Ergonomics has pointed out that the study of man at work calls for experience in anatomy, physiology and psychology. Collectively it is called as ergonomics i.e. human engineering poor ventilation, low

illumination high temperature and unbearable noise levels in industry result in loss of efficiency or productivity.

Martand T. Telsang (2000), - in his book Industrial Engineering and Production Management has written that originally productivity was used to rate workers according to their skills. Today we have machines that are completely controlled by computers, so they are powerful tools towards improving productivity

O. P. Khanna (2007)- in his book Work Study motion and Time Study – The Principle Objective of work study is to improve productivity and lower unit cost, thus allowing more goods and service to be produced for more people.

M. N. Pal (2007) and Others in the book Introduction to Work Study – Through out the history of Civilisation, there has been a constant efforts to improve the utilisation of resources. A necessary requirement for this is to define appropriate measures of performance for systems. The concept of productivity provides us with ne such measure.

Srivastav R. P.S. (2007) - in his book Entrepreneurship Development and Production Management – Productivity involves a balance between factors of production by technique of maximum results and by use of minimum resource. The importance of productivity lies on the fact that it has great impact on the happiness and prosperity of a nation.

Dr. Srinivas Gondhalekar and Dr. Uday Salunke (2002), in their ‘Productivity Technique’ has classified hard factors and soft factors of productivity improvement – hard factors are cost, quality, availability of power, water, waste disposal, transportation, land etc. Whereas soft factors such as political and social economic factors and quality and skilled workforce.

P. C. Tripathi - in his book Personnel Management and Industrial Relations has interestingly stated the importance of human factor at work in improving the productivity and efficiency in the organisations. This resource has unique characteristic which is able to produce an output greater than its input. Man alone can produce through motivated creativity an output greater than the sum of his inputs. This resource is animate, active and living. It is man alone who with his ability to feel, think, conceive and grow shows satisfaction or dissatisfaction, resentment or pleasure, resistance or acceptance for all types of managerial actions. All other resources which are inanimate, inert and passive do not act in this way. All emotional problems emanate form human factor only. Human resource is most complex and unpredictable in its behaviour. There is no cook book formula to guide a manager how to motivate his workers. A manager can buy his worker’s time, he can buy his physical presence at a given place, he can buy a measured number of skilled muscular motions per hour of day, but he cannot buy worker’s enthusiasm, initiative, loyalty, devotion. In employing and supervising people and in endeavoring to reach their motivation, a manager must follow tailor-made approach based on his understanding of the actions, attitudes, needs and urges of the worker concerned. This human resource appreciates in value with the passage of time. As time passes people become experienced and skilled. It is not so with other resources which generally depreciate as time goes on.

Satish Pai and others in their, ‘Management development skills for Excellence’ (2002) – Human resource is the main assets for orgnisational performance. Creditability and higher productivity. The skills and capabilities of personnel play a crucial role in achieving business excellence and can mobilize an entire organisation to thrive as profit pool over the long term.

Dr. P. C. Shejwalkar and Adv. Shrikant Malegaonkar in their book Personnel Management and Industrial Relations put a great challenge to Govt; Organisations, National productivity council and local councils and experts in this line by stating that – Productivity drive is based on the attitude of mind. Productivity drive will not be successful unless the formula for sharing the gains of production between the labour, the management and customers is accepted.

IV) HYPOTHESIS:

- 1) Productivity and efficiency can be improved with high quality in modern machines.
- 2) Efficiency improvement is possible of material and methods of its operation are given due attention.
- 3) Human factor at work is the most contributing factor in productivity improvement.
- 4) A new outlook towards this human factor by corporate managers is must i.e. work culture, working condition improvement and employee empowerment is given high weightage for industrial and economic development of

a nation.

V) METHODOLOGY:

The data collected for this research paper is secondary one. It is collected from various books, journals, magazines, news papers, websites etc. The collected data is systematically arranged and analysed.

VI) ANALYTICAL EXPLANATION:

The term productivity is the ratio of output to input. So, productivity can be increased by reducing the input, for the same level of output or by increasing output with same level of input or by combination of both. This can be achieved by elimination of waste, improved technology, better production design and management efforts. There can be increase in productivity by reducing down frame of maintenance, reduction in input, better quality of goods improved utilisation of resource, reduction in working capital requirements, reduction in inventory size, improvement in manpower skills through training output can be increased by better leadership management. When employees are better motivated output can be increased. Different control techniques such as time and motion study, work study, inventory control materials management, value engineering, pert/cpm preventive maintenance, Human Resource Development MBO and so on but still the productivity was partial.

Japanese View about Productivity - Japanese agreed that productivity improved must reflect in improved standard of living of masses. The quality goods should give satisfaction no complaints, no repair and less cost and goods should be available whenever needed. The process of achieving result is equally important as result for getting quality goods. Productivity as per Japanese view is

$$\text{Productivity} = \frac{\text{Production as per demand}}{\text{Minimum inputs of Resources}}$$

This resulted in rendering men and machines idle for considerable time during shifts. The productivity model was changed to TOTAL WASTE ELIMINATION. Waste do not add value to further the process. The activities such as machine set up, inspection, maintenance, loading/unloading of machines, packing, dispatching etc. were branded as unproductive. The Toyota Production System was developed over a period of twenty years by Mr. Taiichi Ohno and has become a model for majority of industries in both Eastern and Western countries. Toyota laid emphasis on 'INVENTORY IS ROOT OF ALL EVILS' and adopted a model where parts were purchased or produced only when needed, thus cutting down raw material, inventory, WIP and finished goods inventory.

A set of new techniques was developed. Their first focus was employees. It decided to share the gains of Productivity with employees, better treatment and facilities, respect for each other, teamwork, and so on. Added to this was lifetime employment with time bound promotion upto a certain level, and, thereafter promotion on merit.

The techniques were mainly focusing on: **Quality, Cost, Delivery, for customer satisfaction**

The targets for productivity improvements were changed from single digit to two three or in some cases even four digits, e.g. from 5-8% to 50-80% or even 100-1000%. Some examples are:

1. Reduction of throughout time by reducing non-value adding time, which accounts for 95% of total production time. Volvo car engine block needs fifteen machining minutes but the engine is ready only after six months due to large batch. As against this Toyota engine takes only eight hours from the time of arrival of engine block till it is fitted on car and goes out.
2. Balancing of operations results in uniform work load on men and machines at all work stations which reduces idle time to a minimum.
3. Reducing batch size- Ultimate aim being single Piece Flow.
4. Source or self or successive inspection help to achieve defect free production.

5. 'Just in Time' system to reduce inventory & its cost.
6. Operator maintenance to reduce breakdowns.
7. Reduce set up time up to nine minutes or sometimes to even less than a minute. (S.M.E.D. – Single Minute Exchange of Die)
8. Involve employees in every activity and decision making by forming groups. (Teams).
9. No rejects, no rework- Latter developed into Total Quality Control (T.Q.C.).

Brief explanation of two successful companies, which are models for quality, productivity and growth.

(a) Western Company – General Electric Company

In the year 2001, General Electric was considered as the best managed company in the world with Jack Welch - CEO. G.E. ranked second in 'Fortune-500' companies in the year 2000, touching their turnover to \$130 billions with profits of \$12.7 billions, highest in the world.

It is the only company, which was listed in 1896 on Dow Jones industrial index and still continues to be there.

Jack adopted Six Sigma Techniques in the nineties to improve and is known as 'Six Sigma Jack.' His values were:

1. Employees' satisfaction - this means higher productivity.
2. High customer satisfaction - this means higher market share due to more customers.
3. Cash flow - this means employees have maintained company's 'Customer Focused' vision.

G.E. backs its values with performance-based-matrices, complete with goals linked to executive incentive pay. In twenty years, G.E.'s stock value jumped from \$20 billions to \$ 560 billions. G.E. operates in more than 100 countries with 340,000 employees and contributes 2% G.D.P. to U.S.A.

(b) Eastern Company – Toyota Motor Corporation

One of the most successful companies that rank in the top tens of Fortune-500 from Japan is Toyota Motor Corporation. In the year 1991, the company became world's number one in car production.

First five companies/countries are listed below with production and profit figures:

Company/Country		Production of Cars	Profit in US \$ (in billions)
1	Toyota	3,180,954	+ 3.13
2	General Motors	2,496,006	- 4.45
3	Germany	5,100,000	--
4	France	3,600,000	--
5	Spain	2,080,000	--

One may wonder: how could the Toyota and Japanese companies succeeded in the world market because of quality, low cost and quick delivery , which were considered as PRODUCTIVITY rather than output/input ratio.

The base of Toyota Production System is the absolute elimination of waste. The two pillars needed to achieve this are –

1. Just in time,
2. Automation

Both these pillars of success have many requirements. One of the important requirements is

(a) For waste elimination, seven wastes were identified Such as over production, time at hand, wasted movements, producing defective parts and rework etc.

(b) Adopting different wage systems:

U.S. System : Put a person to job, Pay attached to job
 Japanese System: Put a job to a person, Pay attached to a person

This system developed the multi-skilled workers/employees concept by which the number of persons needed was reduced drastically by loading persons for much longer periods in working time as against ‘one man, one skill, one job’ system.

Toyota introduced a new idea under Q.F.D. (Quality Function Deployment) i.e. getting customers feedback and incorporating it in the new model, novel ideas, customer satisfaction, customer service, miniaturizing etc. The idea was that in case of breakdown of your car anywhere in U.S.A., you could call (toll free) the number and ask for the mechanic for repairs, assistance to tow the car and a spare car. The service will be available just in half an hour. The other ideas are – repair/servicing within shortest time, exchange of goods, return of purchased goods without being asked any questions and get the cash back etc.

The Toyota Production System is being replaced shortly by computerized system and by adopting newer technologies.

New definition of productivity is $P = \frac{\text{Required Output}}{\text{Minimum Input}}$

Per employee output is one very important measure of productivity. Illustration,

Country	No. of Cars Produced per employee per year
Japan	50
USA	42
India	2
Toyota	60

Selling products to customers at affordable price will be the next important step.

Japanese changed their attitude to productivity improvement by reduction in wastage, higher men and machine utilization etc. They argued that the approach should be total productivity improvement in every sphere of activity and the increase must reflect in bottom line. Increase of 100% or even to 1000% or more replaced the marginal increase of 5-10% in productivity.

The Indian approach is focused on labour productivity and marginal increases and does not take into account quality unless forced.

In short, productivity means reduction in waste, high men and machine utilisation, reduction of throughput time, higher sales with same input, no rework and defects, no inventory, increase in sales and profit, arranging flexibility in operation/work/activity, productivity improvement means quality improvement which is achieved by process improvement,

Factors Affecting Productivity:

The following factors affect the productivity:

- (a)Investment
- (b)Capacity utilization
- (c) Age of plant
- (d)Years of use for equipments
- (e)Capital/labour ratio
- (f)Research & Development
- (g) Government policies
- (h) Power crisis
- (i)Morale of workers
- (j)Motivation
- (k) Work force mix
- (l)Work ethic
- (m) Uncertainty of job
- (n)Influence of union
- (o) Strike, lock out & layoff
- (p)Management

VII)MEASURE TO IMPROVE PRODUCTIVITY AND EFFICIENCY OF WORKER:

Basic Techniques For Improvement Of Productivity:

Productivity improvement techniques may be classified as:

(I) Product-based techniques:

Based on product engineering and/or marketing such as Product standardization, product diversification, product reliability, product improvement, product simplification, Research and development, Value analysis, advertising and promotion.

(ii) Technology-Based-Techniques:

Based on computer, robotics and/or electronics – Electronics data processing, Group technology, CAD, Maintenance Management, CAM, Laser beam technology, Robotics, Rebuilding and machineries.

(iii) Task Based Techniques:

Based on ergonomics and/or industrial engineering- Method engineering, Job design, Work measurement, Human engineering, Job evaluation

(iv) Material Based Techniques:

Based on system control, material management and or operation research- Material management, material requirement and planning, Material handling, System improvement, Material reuse and recycling, Inventory control, Quality control, Material wastage.

(v) Employee-based techniques:

Based on management, psychology and/or behavioral science – Working environment, Training, Employees participation, Communication, Education, Job enrichment, Job enlargement, Job rotation, Skill enhancement, Learning curve, Management by objective (M BO), Quality circles, Zero defects, Recognition, Employee promotion, Financial incentives, Fringe benefits, Punishment.

Improving the total productivity ensures the reduction of the cost/unit which is the primary goal of productivity management system.

HUMAN ASPECTS ON PRODUCTIVITY IMPROVEMENT:

Improvement of productivity has profound effect on economic vitality of a nation and its citizens. There are systematic and effective methods for obtaining improvement. These methods can be categorized in two distinct categories Human, Engineered. Motivation, morale, discipline, communication change, training etc. fall under human factor whereas time motion, study, work, sampling, analysis techniques, etc. takes care for engineered factor.

1) Motivation: The attitudes and performance of works play important role in improving productivity. A motive is a state which disposes certain behaviour and seek for certain goal. It is said that attitudes pave the way for development of motives and some behaviour is chosen on the basis of a particular motive.

Motivation = f(Motive x Expectancy x Incentive)...

Relation Between Various Aspects of Motivation

Heredity	Make-up of			Course of
Experience →	individuals →	Attitude →	Motives →	Action/Goal
Environment	Background			Behaviour

2) Morale: Morale is related to the concept of motivation. The morale is an attitude of mine of a person. The attitude comprises of combination of feelings, emotions and work habit. People with high morale tend to enjoy their jobs, show more initiative and drive, cut costs, save raw materials, and thereby improve productivity and vice versa for low morale cause.

3)Discipline: Discipline means mode of life hence it is a control concept. Discipline regulate one's behaviour, generates interest in the work and propagate the feeling of self respect. Strict discipline in the long run is the more reasonable and participative approach may be more effective toward improvement of productivity.

4)Change: Management of change is vitally important in raising or maintaining productivity. Cause for change in the organisation may be (a) External and (b) Internal. The external factors are beyond the control of management. The internal factors includes changes in production flow, scheduling methods, controlling steps, quality of raw materials supplied etc.

5)Communication: It refers to the adequate and timely flow of information with a feed back mechanism from workers to top management and vice versa. The communication technique has a impact in positive long term on productivity.

VIII)IMPORTANCE OF PRODUCTIVITY IMPROVEMENT:

The importance of productivity is viewed as below:

1.To beat the competition: It is an age of cut-throat competition. There may be other commodities which can serve as the substitutes of the terms 'product' and can attract the consumers' purchasing power. The firm whose productivity is higher can only beat the competition and can exist in the market for long.

2.Guide to Management: The productivity indices are very useful for the management and can be used for different purposes. These indices can serve as a valuable guide to the management for improving the performance of its enterprises. The productivity measures can be used for the following purposes:

(a)Strategic: With the help of productivity indices, the efficiency of different firms can be measured, analysed and compared. The necessary steps can be taken to improve the productiveness of the firm taking in view the productiveness of the other competitive firms.

(b)Tactical: Different units or these factors of the firm can also be compared as regards to their productivity and the productivity of the less productive units or sectors can be improved.

(c)Planning: A firm uses different inputs in producing the goods. A comparison of relative benefits accruing from the use of different inputs can be had and the most beneficial input can be used in production. It helps the management to plan for the future.

(d)Administration: Productivity indices indicate the progress of the firm over a period of years. The productivity of different inputs, including labour, can be measured individually. The individual productivity indices help the management in bargaining with the labour leaders, trade unions and the Government in case of labour disputes regarding welfare activities. Thus administration can be improved with the help of productivity indices.

3.An Indicator of Progress: In economically backward countries, productivity movement is basic aspect of progress. It implies the development of an attitude of mind and a constant urge to better, cheaper, quicker and safer ways of doing a job, manufacturing a product and providing a service. In an urge to improve the productivity, new inventions take place. This productivity is an aspect of basic progress.

4.Maximum Utilisation of Scarce Resources: In order to provide the articles or commodities to the consumers at the lowest possible cost, the productivity urges to utilise the available resources to the maximum to the satisfaction of customers. The productivity processes and techniques are designed to facilitate more efficient work involving less fatigue to workers by improvements in the layout of the plant and work, better working environment and simplification of works.

5.Key to National Prosperity: The productivity in fact, has become the synonymous to progress. Higher productivity is an index of more production with the same inputs at lower cost. It enables industry to offer goods to the general public at cheaper rates and results in expansion of markets. the working conditions and ages of workers will improve and industrialists too will get larger profits. Thus higher productivity is the key to national prosperity. The secrets of Japan and Western Counties' prosperity lie in increased productivity.

6.Prosperty of Labour: The labour productivity is a boon to labour also. It brings improved working conditions, better wages and salaries to workers, better labour welfare activities to labourers. Thus their standard of living is improved.

7.Higher productivity increases the profits and reserve funds of the industry that can be used for expansion and modernisation.

8.It increases the goodwill of the firm due to cheaper goods to the public, well-off staff and more profits and better financial position.

9.It improves the competitive strength of the company in export markets through reduction in cost of production and quality products.

In this way, productivity is the only way to make the overall progress of the country.

IX) CONCLUSION

- 1) Per worker productivity and efficiency can be increased by applying different techniques in the organisation.
- 2) High productivity can be achieved by motivating employees which leads to increase in production & services at low cost made available to the customers.
- 3) Productivity can be improved by product reliability, product simplification, waste reduction.
- 4) The modern technology based on computer, robotic, maintenance management, group technology also help in per worker productivity improvement.
- 5) The employee morale, discipline, change in attitude, proper communication at work place boost the productivity.
- 6) The recent technique time and motion study, work study, inventory control leads to increase in higher productivity.

X) REFERENCES

- i)B. S. Goel, Production and Operation Management.
- ii)O.P. Khanna, 2007, Work Study – Motion & Time Study, published by Dhanpat Rai Publications, New Delhi.
- iii)M. N. Pal, A. K. Chatterjee, S. K. Mukherjee, 2007, Introduction to Work Study – Indian Adaption, published by Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- iv)Satish Pai, S. Raishankar, S. V. Kamat, Upinder Dhar, 2002, Management Development Skills for Excellence, published by Himalaya Publishing House.
- v)Martand T. Telsang, 2000, Industrial Engineering and Production Management published by S. Chand, New Delhi.
- vi)Dr. H. S. Shan, Work Study and Ergonomics.
- vii)S. L. Rao, 1985, National Conventions on Low Productivity and High Cost.
- viii)P. C.Tripathi, 2002, Personnel Management & Industrial Relations.
- ix)Dr. Srinivas Gondhalekar and Dr. Uday Salunke, 2002, Productivity Technique.
- x)Srivastav R. P. S., 2007, Entrepreneurship Development and Production Management, published by Himalaya Publishing House.

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