

# Productivity Improvement Of Furniture Industry By Using Time Study Method

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**Abstract:—** Today, every organization has one aim is to increase the productivity and increasing the demand of product in market. But the problem is that there are many competitor in market they are manufacturing same product because of that every manufacturing industries are now facing challenges. To deal this challenges industry has work for improving the productivity with the improvement in quality of production, reducing the cost of product or at the same cost increase the number of product or production rate. To execute all of these efficiently time study is one of the crucial operation need to perform. The work carried out on the panel saw machine for cutting operation to cut the number of sheet. The work focuses on the industry productivity improvement with the astute use of time study technique mixed with modern soft skills.

**Key Worlds:** Time study, Productivity, Cycle time, Panel saw.

## I. INTRODUCTION

Productivity improvement is an everlasting continuous activity in manufacturing. Industries need to develop capability of coping up with customer demands to deliver quality products on time. Continuous improvement is the need of the hours which can be achieved by incorporating flexibility in layout, design and processes. This paper is aimed at improving productivity of mixed model production system of a medium scale manufacturing industry through work measurement approaches. The systematic application of method study, and time study to improve productivity, reduce costs and improve profits. To execute all of these efficiently time study is one of the crucial operation need to perform. This paper focuses on developing a time study for a reputed furniture industry. The objective is to establish a time standards for carrying out specified job and thus helping the company in scheduling.

Analysis of operations required to produce a manufactured article in a factory, with the aim of increase efficiency. Time study is important factor that control the productivity. Industries need to develop capability of coping up with customer demands to deliver quality products on time. By using the time study an assumption of total time needed for any particular product can be made, that is really important to make the delivery of the product to the buyer on exact time. The research based on industry there we are going to work on time study analysis. In this research is carried out for reputed furniture industry, there we worked on panel

saw machine. Our objective is to reduce the lead time of work process by applying time analysis. Time study method by Stopwatch technique is used for this purpose. The given a target to the operator to carry out or cut is 40 unit. This is the same target for each day of each shift. Our work is there it is possible to reduce the lead time and increase productivity by the use of stop watch time study method and we were work on it.

## II. LITERATURE REVIEW

For the analysis of operation to increasing the productivity safely and effectively to produce the number of sheets maximum as possible as at the same time of shift, at the same cost and it will helpful for working or production schedule. The first effort at time study was made by F. W. Taylor in the 1880s. He published his famous article "The Principle of Scientific Management" which involved getting the best person for each job and trained them to do it in the best possible way. In the early twentieth century Frank and Lillian Gilbreth developed a more systematic and sophisticated method of time study for industry taking into account the limits of human physical and mental capacity and the importance of good physical environment[1].

The aim of the work measurement technique is to find the time required to do a job by a qualified operator working at a standard space and using the standard methods. 'a work measurement technique for recording the times and rates of working, for the elements of a specific task carried out under the specific conditions and for analyzing the data so that to obtain the time necessary for carrying out the jobs at a defined level of performance'. In time study technique of work measurement, the stop watch is used to find out the time

required for a qualified worker to carry out a specific task. The time study was oriented and developed by F.W. Taylor and is concerned with the direct observation of work while operator is doing[2]. A sliding panel saw was invented by Wilhelm Altendorf in 1906 in Germany[3.b]. Its invention set a new standard in woodworking, with dramatic differences from traditional machines. Up to that time, a conventional table saw had no mechanism for edging. Meaning that for the first and second longitudinal cut on untreated massive wood, the lumber always had to be fed manually through the saw blade. The new system accomplished the task more elegantly by allowing the work piece to be fed through the saw blade while lying on a sliding table. Thus cutting becomes faster, accurate and effortless[3].

### III. PANEL SAW

A panel saw is type of sawing machine with a sliding table that cuts sheets into sized parts. Panel saws are used by cabinet shops to easily cut panels, profiles, solid-wood, plywood, laminates, plastic sheets and melamine sheets into sizes or cabinet components. Some higher end panel saws feature computer controls that move the blade and fence systems to preset values. Other lower end machines offer simplicity and ease of use, including full scale hobbyist level panel saws at a mere fraction of the cost. While the entry level machines are designed for light duty usage, they offer home dryers a cheap alternative for infrequent cutting when accuracy and clean cuts are not required. Panel saws can have one main saw blade, or a scoring along with a main saw blade. Scoring is used to create a groove, especially in double side laminate before the main saw rips the piece apart, to avoid chipping. The scoring saw rotates in an opposite direction, as the main saw to avoid chipping.

#### Silent Features







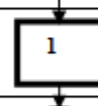

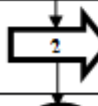

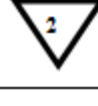
- Burr free cutting & right angle cutting.
- Smart and heavy duty structure.
- Can 450 degree for degree cutting, also can read digital and manual.
- Extra support for wood sheet and high accurate cutting.
- High precision and long life sliding table for work.

### IV. TIME STUDY

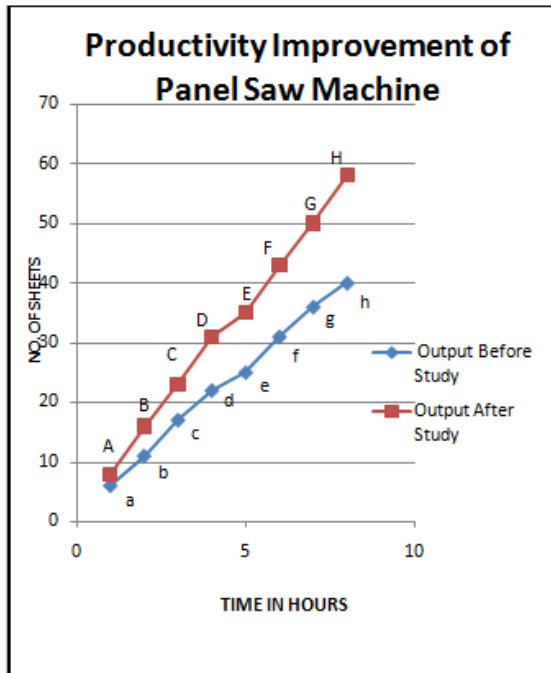
Time study is define as ‘a work measurement technique for recording the times and rates of working, for the elements of a specific task carried out under the specific conditions and for analyzing the data so that to obtain the time necessary for carrying out the jobs at a defined level of performance. The ratio between output and input is known as productivity. Out put in the form of product or good produce and input in the form of man

power, material and machine. Cycle Time is defined as the actual time taken to complete a set of activities (one cycle). Flow chart of the furniture industry shows material motion and it is manual flow process where we are studied. Table 1 shows the activity and description.

**Table1. The symbolic representation of activity (Material flow type of Furniture Industry )**

ACTIVITY	D E S C R I P T I O N
	L y i n g i n s t o r e
	T o m a c h i n e
	L o a d o n m a c h i n e
	M a c h i n i n g ( c u t t i n g e d g e )
	G a u g e s e t t i n g
	M a c h i n i n g ( c u t t i n g i n t o n o. o f p i e c e )
	I n s p e c t ( c u t t i n g p i e c e s )
	U n l o a d
	T o s t o r e
	P l a c i n g
	S t o r a g e i n r a c k

**V. RESULT**



**Figure1. The schematic representation of the results obtained before and after time study**

Applying principles of time study the output of the furniture industry is increasing as shown in figure1. The output before study was 40 sheets and the output after time study is 58 sheets. After study is carried out it observed that output of the furniture industry increased the cutting of number of sheets. It is help to the organization to increasing in productivity because increment in profit and it is helpful to the growth of the organization. The rate of average production is increased by 45%. Production per shift of company before study = 40 units Production per shift of company after study = 58 units

**CONCLUSION:**

Productivity helps an organization to not only in increasing economy at micro level benefiting at both financial as well as labor performance output standard. But still in today's organization I feel that total factor productivity, by contrast, captures the contribution to output of everything except labor and capital: innovation, managerial skill, organization, even luck. But finally we conclude that this technique adopted depends entirely upon the complexity of the labor-management relationship that exists in each individual situation. From the above discussion, it is clear that a

standard can be maintained in the garment sector to get the maximum production by using the time properly. Different time is needed to sew the different parts of a product. As a result time variation is must. Since garments are made with the help of different operator, time limitation must be given to achieve the target production. To set a standard target for different product time and time study is mandatory. By making the time target production can be achieved. This is the target achieved after full accuracy. But it is not possible for every time. Still it is concluded that the more production rate can be achieved by time study analysis.

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