Int. J. Chem. Sci.: 14(S2), 2016, 519-526
ISSN 0972-768X
www.sadgurupublications.com

TIME ANALYSIS WITH MOST TECHNIQUE

J. SENTHIL* and G. HARIPRIYA

Mechanical Engineering, Aarupadai Veedu Institute of Technology,
Vinayaka Missions University (T.N.) INDIA

ABSTRACT

Time and motion study sets to be the target of any industry to improvise the plant efficiency. The actual time consumed for machining a valve time controller is been captured and comparative is studied with a predetermined motion study called MOST viz., Maynard Operation Sequence Technique. The sequence of machining is considered as the optimized sequence and operator motion, plant layout arrangement with time consumptions are evaluated for comparison**.**

Key words: MOST, Actual time, Optimised sequence.

INTRODUCTION

A time and motion study is a process efficiency technique combining the Time Study work of Frederick Winslow Taylor with the Motion Study work of Frank and Lillian Gilbreth. It is a major factor which emphasises on the time requirement for the process to achieve the goal, the hindrances and also on efficient time management. Time study was developed in the direction of establishing standard times, while motion study evolved into a technique for improving work methods. These two techniques integrated and redefined into a widely accepted method applicable to the improvement and upgrading of work systems.

A predetermined motion time system (PMTS) is frequently used to set labour hour rates in industry by quantifying the amount of time required to perform specific tasks. This system was known as Methods-time measurement, released in 1948 and today existing in several variations, commonly known as MTM-1, MTM-2, MTM-UAS, MTM-MEK and MTM-B. Obsolete MTM standards include MTM-3 and MMMM (4M). The MTM-2 standard has also largely been phased out by the organization, but is still used in some commercial applications. Predetermined motion time system is another term to describe Predetermined Time standards (PTS).

*Author for correspondence; E-mail: jsenthil@avit.ac.in, hari_priya.ganesh@yahoo.co.in

MOST

Maynard Operation Sequence Technique (MOST) is a predetermined motion time system that is used primarily in industrial settings to set the standard time in which a worker should perform a task. To calculate this, a task is broken down into individual motion elements, and each is assigned a numerical time value in units known as time measurement units, or TMUs, where 100,000 TMUs is equivalent to 1 hr. All the motion element times are then added together and any allowances are added, and the result is the standard time.

The most commonly used form of MOST is Basic MOST, which was released in Sweden in 1972 and in the United States in 1974. Two other variations were released in 1980, called Mini MOST and Maxi MOST. This allows for a variety of applications-Mini MOST is commonly used for short (less than about a minute), repetitive cycles, and Maxi MOST for longer (more than several minutes), non-repetitive operations. Basic Most is in the position between them, and can be used accurately for operations ranging from less than a minute to about ten minutes.

Practical study

Machining process in valve time controller is been initially studied at the industry and the operation sequence are been channelized. The first part of each day is taken as the problem to be standardized using time and motion study technique. For time study, the best methodology opted is Stop watch method. A stopwatch is a handheld timepiece designed to measure the amount of time elapsed from a particular time when it is activated to the time when the piece is deactivated. A large digital version of a stopwatch designed for viewing at a distance, as in a sports stadium, is called a stop clock. The entire process consist of eight operations and the perspective of this study is to evaluate whether the sync between proper time utilisation and exact time taken for the given operation. Here we consider the gauging, movement of operator and adjustments made by operator in each operation as whole.

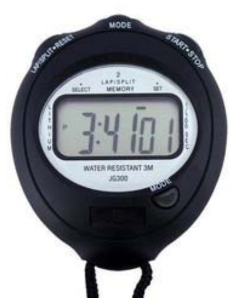

Fig. 1: Stop watch model used

Table 1: Actual stop watch values

Operations	Stopwatch time in mins
1	0:05:40
2	0:03:20
3	0:00:50
4	0:00:58
5	0:05:37
6	0:01:29
7	0:02:50
8	0:00:32

The above mentioned table explains the time utilised in gauging of each part during the machining process. For each operation the measuring needs varies and methods used to measure varies, we consider this method as the optimised method to gauge and time consumed practically at each operation.

MOST Method study

MOST Systems are designed to provide the optimal combination of speed, detail and accuracy of an analysis at all levels of application. MOST was designed to be much faster than conventional work measurement techniques such as time study. Through this method the standardised gauging and motion time are allocated using the Basic MOST.

Table 2: MOST Values

Operations	MOST Time in min
1	0:04:25
2	0:02:48
3	0:00:48
4	0:00:58
5	0:05:18
6	0:01:24
7	0:02:12
8	0:00:48

1		A	B	G	P	M	X	
	GET THE PART	3	16	1	3	3	667.2	
	GO TO MEASURE	10	6		1			
	RETURN	10	16	1	3			
				SUM	70	3	667.2	
				TMU	700	30	6672	
				Seconds	25.17986	1.079137	240	
				Seconds	266.259			
2		A	B	G	P	M	X	I
	GET THE PART	3	3	1	1	6	389.2	16
	GO TO MEASURE with Ra	16	16	1				
	RETURN	16	3	1	3			
				SUM	64	6	389.2	16
				TMU	640	60	3892	160
				Seconds	23.02158	2.158273	140	5.755396
				Seconds	170.9353			
3		A	B	G	P	M	X	I
	GET THE PART	3		1		6	111.2	10
	GO TO MEASURE	1	10	1				
	RETURN	1		1	0			
				SUM	18	6	111.2	10
				TMU	180	60	1112	100
				Seconds	6.47482	2.158273	40	3.597122
				Seconds	52.23022			
4		A	B	G	P	M	X	I
	GET THE PART	1	1	1		3	127.88	10
	GO TO MEASURE		3	1	1			
	RETURN	1	3	1	3			
				SUM	16	3	127.88	16
				TMU	160	30	1278.8	160
				Seconds	5.755396	1.079137	46	5.755396
				Seconds	58.58993			

Fig. 2: MOST formulating

		A	B	G	P	M	X	I
5	GET THE PART	3	3	1		3	817.32	16
	GO TO MEASURE	16	16	1	6			
	RETURN	3	3	1	3			
				SUM	56	3	817.32	16
				TMU	560	30	8173.2	160
				Seconds	20.14388	1.079137	294	5.755396
				Seconds	320.9784			

		A	B	G	P	M	X	I
6	GET THE PART	3	3	1		3	189.04	10
	GO TO MEASURE with Ra	3	10	1	6			
	RETURN	3	3	1				
				SUM	34	3	189.04	10
				TMU	340	30	1890.4	100
				Seconds	12.23022	1.079137	68	3.597122
				Seconds	84.90647			

		A	B	G	P	M	X	I
7	GET THE PART	3	3	1		3	333.6	10
	GO TO MEASURE with Ra	3	10	1	6			
	RETURN	3	3	1				
				SUM	34	3	333.6	10
				TMU	340	30	3336	100
				Seconds	12.23022	1.079137	120	3.597122
				Seconds	136.9065			

		A	B	G	P	M	X	I
8	GET THE PART	3	3	1		3	94.52	10
	GO TO MEASURE with Ra	3	10	1	6			
	RETURN	3	3	1				
				SUM	34	3	94.52	10
				TMU	340	30	945.2	100
				Seconds	12.23022	1.079137	34	3.597122
				Seconds	50.90647			

Fig. 3: MOST Formulating

The above figures give the expression of MOST equations. The index value of each variable is been taken from the standard MOST chart.

The variables in the above figures represent.

Table 3: Variables of MOST and its significance

Variables representation	Variable Significance
A	Action distance
B	Body motion
G	Gain control
P	Placement
M	Controlled move
X	Process time
I	Alignment

For each action of operator the time is evaluated using TMU. TMU stands for Time measurement units.

1 second = 27.8 TMU in general, that is from 1 hour = 100000 TMU.

Comparative data analysis

As the two separate extreme of practical and MOST Techniques used to measure the time and motion of machining process, Table 3 gives the comparative value. The below graph elucidates the time gap between the operations and the area to be concentrated for time management.

Table 4: Comparison data of Stopwatch and MOST method

Operations	Stopwatch time in min	Most time in min
1	0:05:40	0:04:25
2	0:03:20	0:02:48
3	0:00:50	0:00:48
4	0:00:58	0:00:58

Cont…

Operations	Stopwatch time in min	Most time in min
5	0:05:37	0:05:18
6	0:01:29	0:01:24
7	0:02:50	0:02:12
8	0:00:32	0:00:48

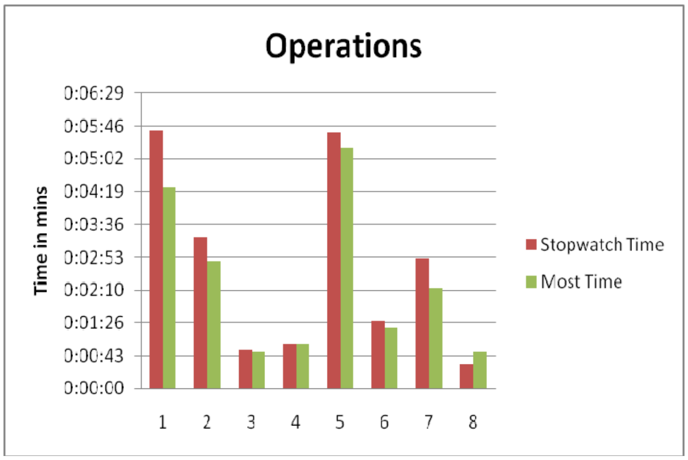

Chart 1: Comparison chart between the standard and actual time

RESULTS

From the above graph and data we could see that MOST technique is most vital and is taken as the standardized time. From actual, MOST is of around 15% profitable and time saving and also leads to time efficiency.

REFERENCES

1. Improvement of Workflow and Productivity Through Application of Maynard Operation Sequence Technique (MOST), Proceedings of the 2014 International Conference on Industrial Engineering and Operations Management Bali, Indonesia, January 7-9 (2014).
2. S. S. PatiI, B. M. Shinde, R. S. Katikar and M. V. Kavade, MOST an Advanced Technique to Improve Productivity, 4.

3. Application of Maynard Operation Sequence Technique (M.O.S.T) at Tata Motors and Adithya Automotive Application Pvt. Ltd. Lucknow for Enhancement of Productivity- A Case Study By Mr. Ankit Mishra, Mr. Vivek Agnihotri & Prof. D. V. Mahindru, Global J. Res. Engg.: B Automotive Engg.

4. Washington Course on Time and Motion Study Techniques.

Accepted : 01.07.2016