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WORK STUDY

MINI PROJECT
MOTION AND TIME STUDY

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1.1 INTRODUCTION:

In this mini-project we will apply motion study (method study) and Time study (work measurement) on an assembly operation of an electrical fan, we will apply these two terms and then compare the results before and after the procedure.

Our Work Will consist mainly of two parts, Method Study and Time Study.
We Will Apply these steps when applying method study procedure:
(1) Select the work to be studied/analyzed and define objectives to be achieved by method study.
(2) Record all relevant facts
(3) Examine all the recorded data information
(4) Modification and improvements in current data
(5) Measure the work content and establish the standard time
(6) Define new method for the job/process/operation
(7) Install and maintain the new method to achieve.
Then We will apply time measurement

1.2 PROJECT GOALS:

1-improvement of processes and procedure
2-improvement in the design of the plant and equipment
3-Efficient materials handling
4-Economy in human effort and the reduction of unnecessary fatigue

02

2.1 APPLYING METHOD STUDY :

METHOD STUDY: IT IS THE ORGANIZED RECORDING AND CRITICAL INSPECTION OF CURRENT AND PROPOSED WAYS OF DOING WORK, AND IT HAS THE BASIC GOALS OF IMPROVING THE PRESENT METHOD, ALONG WITH:

- **DEVELOPING AND APPLYING THE BEST ALL-AROUND METHODS OF PERFORMING EACH OPERATION.**
- **SIGNIFICANTLY ELIMINATING WASTAGE TO INCREASE OVERALL PRODUCTION AND REDUCE COSTS AND FATIGUES OF WORKERS.**
- **ELIMINATING UNNECESSARY MOVEMENTS OF WORKERS, TOOLS, MACHINES OR REPLACING THEM.**

2.1.1SELECT:

The selection is the first step we have taken in studying the movement, as we have searched in YouTube on an industrial process that takes economic, human and technical factors into consideration. Accordingly, we will explain in the following the summary of the industrial process and the reason for choosing the video in all respects that we will work on in the next steps.

Video Barcode

Video summary: The use of sawdust and its pressure is done by a central machine and a number of workers under a certain pressure to form a particleboard with beautiful decorative shapes.

The reason to choose the video:

- The main reason for choosing the video is that the shaping process is an easy and clear process, despite that there are many errors, defects and waste of effort and wasted time. But when we are very involved in the forming process and follow certain procedures such as method study and time study, production from the forming machine will increase in a very record time without wasting effort, time and resources.
- All of our group member chose this video because we can do more than one chart in it as:

1) man- machine.
2) Flow process man or machine.

Also, because the machine's working time and the workers' working time are clear in this video.

- We also chose this video because it contains obvious defects that we can make improvements to.

The defects are as follows:

1-defects in the movement of workers that we can make improvements to.
2- the unsafe conditions in the factory, Whether it's unsafe clothing also not having hand Protector when around the machine.
3- Movement of workers and time taken.
4- Forming machine working time.
5- how much time taking the workers' to make the Sawdust in a good way before the machine starts.

2.1.2RECROD:

After we chose the video clip, which is a video clip showing the process of shaping sawdust, in this step we will record and collect data about the video clip. man-machine type). In the flow process chart, we recorded the progress of the process as a whole, and we also made this chart for the current method as well as for the improved method. As for the multiple activity chart (man-machine type) technique, we recorded the operation provided by the main worker in the process, as well as the operations performed by the machine, as well as the machine's idle time during the operation time, and we have made a chart of the present method and another chart of the improved method.

Process Chart

Job/Operation /part /Task	Pallet making	Summary	Number of steps	Time (Sec)	Distance (M)
		Operation O	7	65.48	
Operator name /No	Group 7	Transport ⇨	8	53	10.96
Analyst		Delay D	2	90	
Method	Present Proposed	Inspection □	3	51	
Date / time :	9/12/2015	Storage ▽			
		Total	20	259.48	

Step	Step description	Symbol					Time	Distance	Remarks
		O	⇨	D	□	▽	(Sec)	(M)	
1	emptying the sawdust into the machine trough	✓					20		
2	going to get the tool		✓				7	2.1336	
3	Distribute the sawdust using the tool	✓					1.48		
4	Given the other worker the tool		✓				3	*0.6012*	
5	The other worker settled the sawdust on the edges of the basin	✓					5		
6	Giving the main worker the sawdust spreader		✓				3	*0.6096*	
7	The main worker checked the evenness of the sawdust with the spreader				✓		5		
8	The worker operates the wood pressing for shaping.	✓					12		
9	Waiting for the machine to shape the wood			✓			59		
10	Going to the control box		✓				10	2.1336	
11	Checking the temperature and pressure of the machine				✓		30		
12	Back in front of the machine		✓				10	2.1336	
13	Waiting for the machine to shape the wood			✓			31		
14	The worker walked to the machine control panel		✓				10	0.9144	
15	Open the forming machine	✓					12		
16	Check wood tenacity				✓		16		
17	Main worker and auxiliary worker lift the decorative wood board from the forming machine	✓					8		
18	Transfer the wood plank with the other boards		✓				5	1.2192	
19	The worker walked to the machine control panel		✓				5	1.8288	
20	stop the forming machine	✓					7		

2.1.2RECROD:

Multiple activity chart (Man-Machine type)

Idle
The worker is working
The machine is working

Operation / Part		Summary	Man	Machine
Operator Name / No	Unknown name	Working Time	3.10 min	1.23 min
Analyst	Group 7	Idle Time	1.23 min	3.10 min
Date	9/12/2015	Cycle Time	4.33 min	4.33 min
Method: Present	Proposed	Utilization ratio	71.59%	28.41%

Worker			MACHINE		
Description	Symbol	Time (min)	Description	Symbol	Time (min)
Emptying the sawdust bags into the machine basin		0.18	Idle		1.59
Go get the wood spreader		0.24			
Distribute the sawdust using the wood spreader		1.43			
Leveling the sawdust on the edges of the basin		1.50			
Checking the evenness of sawdust using the spreader		1.53			
Turn on the machine		1.59			
Idle		2.47	The temperature rises and the upper part of the machine went down to the sawdust basin		2.3
			The machine compresses the sawdust to form them together		2.47
Walk to the machine control panel		2.53	Idle		3.18
Checking the temperature and pressure of the machine		3.18			
Idle		3.40	The machine compresses the sawdust to form them together		3.40
Walk to machine		3.43	Idle		3.44
Open the forming machine		3.44			
Idle		3.56	The machine stopped pressing the wood and the upper part of the machine rise away from the sawdust basin		3.56
Checking the cohesion and hardness of sawdust		4.07			
Take out the decorative wood panel from the forming machine		4.10			
Transfer the wood plank with the other boards		4.18	Idle		4.32
Walk to the machine control panel		4.29			
Press the stop button of the machine		4.32			
Idle		4.33	A machine started to stop, and its temperature decreased		4.33

2.1.3EXAMINE:

After we recorded the method using the appropriate diagrams in the previous step, we will now examine all the recorded data by asking primary and secondary questions. Answering these questions will lead to the development of a better method, as by doing this questioning we can eliminate unwanted activities and can integrate A number of activities or their rearrangement, and the current method can be simplified. We note that all of this will reduce production time and thus increase productivity in record time. We have clarified the primary and secondary questions for all the steps of the process as follows

PRIMARY QUESTION:

answers to these questions show up the NECESSITY of carrying out the activity.

Purpose

What is actually done? why is the activity necessary at all?

The sawdust is pressed using a molding machine so as to make a decorative wood panel

The activity is necessary because it turns unused sawdust into a wooden board that can be used

Place

where is it being done? Why is it done at that particular place?

In the factory .

Because the factory is the safe it place to do these kinds of work.

Sequence

When is it done?

9DECEMBER 2015

Person

who is doing it? Why is it done by that particular person ?

The workers at the factory.

Because the workers are very trained people for these kinds of jobs.

Means

How it is being done? why is it being done in that particular way?

This is done by placing the sawdust in the basin of the wood shaping machine, after which the machine is operated to compress the sawdust. The plank is formed from sawdust by the forming machine because it is easy to use and fast

2.1.3EXAMINE:

SECONDLY QUESTION:

answers to these questions allow to determine whether possible to alternative methods of doing the activity are practical and preferable

Purpose

What is done?

A wooden board was made using sawdust

Why is it done?

Because sawdust is not useful until it is pressed and shaped

What else might be done?

Wooden poles can also be made using sawdust

Place

Where it done? Where else could it be done?

was done in a factory that contain high quality pressing machines. This work can also be done in a factory near the sawdust distribution center or near the export centre.

Sequence

when is it done?

At 9th of December 2015

When might it be done?

At any time of the year

When should it be done?

At spring season, it's the best time to do such exhausting work

Person

Who else should do it? Who dose it ?

This work can be done by an experienced worker in the factory or by several workers. It was done by workers who are experts in the machine, and another worker in the factory who is expert in the machine can also do it

Means

How is it done?

This is done by putting sawdust in the pressing machine

Why is it done that way?

Because this method is easy and fast

How else might it be done?

A wooden board can be made from sawdust using manual met

2.1.4MODIFICATION AND IMPROVEMENTS:

The analysis of existing work method can provide a starting point for a synthesis of suggested improvements in job performance. The technique specially designed to modify and improve in the current data which method is practical and economical to find or develop new or alternative best method.
process of method development is the simplification of activities in order to allow the operator/worker to complete the job more quickly and easily by reducing the number of operations, reducing or eliminating the delays and storage etc.

Process Chart

Job/Operation /part /Task	Pallet making	Summary	Number of steps	Time (Sec)	Distance (M)
		Operation O	6	65	
Operator name /No	Group 7	Transport ⇨	4	23	5.4828
Analyst		Delay D	2	86	
Method	Proposed Present	Inspection □	3	50	
Date / time :	9/12/2015	Storage ▽			
		Total	15	224	

Step	Step description	Symbol					Time	Distance	Remarks
		O	⇨	D	□	▽	(Sec)	(M)	
1	emptying the sawdust bags into machines basin	✓					18		
2	Getting the tool		✓				6	1.8288	
3	Distribute the sawdust using the tool also Distribute it on the edges of the basin	✓					9		
4	The main worker checked the evenness of the sawdust with the spreader				✓		5		
5	The worker operates the wood pressing for shaping.	✓					11		
6	Waiting for the machine to shape the wood			✓			57		
7	Assessment worker Checking the temperature and pressure of the machine in the control panel				✓		29		
8	Waiting for the machine to shape the wood			✓			29		
9	The assessment worker reach the control panel		✓				8	0.6096	
10	Open the forming machine	✓					12		
11	Check wood tenacity				✓		16		
12	Main worker and auxiliary worker lift the decorative wood board from the forming machine	✓					8		
13	Transfer the wood plank with the other boards		✓				5	2.4384	
14	The assessment worker reach the control panel		✓				4	0.6096	
15	stop the forming machine	✓					7		

2.1.4MODIFICATION AND IMPROVEMENTS:

Multiple activity chart (Man-Machine type)

Idle
The worker is working
The machine is working

Operation / Part		Summary	Man	Machine
Operator Name / No	Unknown name	Working Time	3.27 min	0.32 min
Analyst	Group 7	Idle Time	0.32 min	3.27 min
Date	19/12/2015	Cycle Time	3.59 min	3.59 min
Method: Present	Proposed	Utilization ratio	91.09%	8.91%

Worker			MACHINE		
Description	Symbol	Time (min)	Description	Symbol	Time (min)
Emptying the sawdust bags into the machine basin		0.10	Idle		1.32
Get the wood spreader		0.13			
Distribute the sawdust using the wood spreader		1.23			
Leveling the sawdust on the edges of the basin		1.26			
Checking the evenness of sawdust using the spreader		1.29			
Turn on the machine		1.32			
Idle		1.45	The temperature rises and the upper part of the machine went down to the sawdust basin		1.35
			The machine compresses the sawdust to form them together		1.45
Checking the temperature and pressure of the machine		2.10	Idle		2.10
Idle		2.22	The machine compresses the sawdust to form them together		2.22
Open the forming machine		2.23	Idle		2.23
Idle		2.29	The machine stopped pressing the wood and the upper part of the machine rise away from the sawdust basin		2.29
Checking the cohesion and hardness of sawdust		3.43	Idle		3.58
Take out the decorative wood panel from the forming machine		3.46			
Transfer the wood plank with the other boards		3.50			
Walk to the machine control panel		3.55			
Press the stop button of the machine		3.58			
Idle		3.59	A machine started to stop, and its temperature decreased		3.59

2.1.5 MEASURE :

At this stage, we divided the process into several elements, then applied the method study to reduce some motions and eliminate unnecessary motions. The standard time in the present method is 4.56 minutes, while in the improved method is 3.88 minutes, and we note that the standard time in the improved method less than the time in present method. At this rate and time, the worker can produce more parts than he produced before the improvement.

-The standard time old method= 273.56 sec
-The standard time new method= 232.92 sec

Note:
the details of the calculations will be present in the part of the time study, but here we have only explained the results we reached.

2.1.6 DEFIN:

After we conducted a full study of the process of forming sawdust and developed a new method for it, we will explain the difference between them with a brief description as follows:

Brief description of the old method:

In the old method, sawdust was manually unloaded, and this took a long time. Also, the sawdust distributing tool was far from the machine, and its use needed a long time because it was a short tool.
The workers work randomly. One of them takes the wood distribution tool from the main worker to level the sawdust on the edges, then returns it to the main worker.
Also, the machine used in the old method is a very old machine that does not have any advantages, and it is very slow in compressing the wood, which leads to an increase in the waiting time of the worker.
After running the machine, the main worker would walk to the control panel to check the pressure and temperature, and then come back to wait in front of the machine. This process made the main worker move a lot and take more time.
After opening the machine, the workers took the wood plank from the machine and then moved it to a place away from the machine, then the main worker returned again to the control panel to stop the machine.
In the end, we note that the old method had a lot of random movements that increased time, effort, and movements. We also note that the machine is slow and needs development.

Brief description of the new method:

We noticed that in the old method, unnecessary steps were taken. We had to delete at least 5 of them. so our plan was
1: One of the workers kept going to the control panel, so we decided to put one of the workers next to the control panel.
2: Putting the tools close to the main worker, such as the sawdust distributing tool.
3: Purchasing a new wood pressing machine that is faster and has higher productivity so it will reduces the wasted time.
4:Sawdust unloading should be by machines instead of manual unloading, it will make the operation faster.
5:Unnecessary step, the main worker should've settled the sawdust on the edges of the basin without given the tool to the assistant worker
6: Putting the wooden panels after taking them out of the machine in a safe place near the machine, to reduce the distance and avoid accidents.
7: Bring a wood spreader whose length is equal to the width of the machine basin to reduce the time wasted Checking whether the sawdust is even.

We note that we will report on the development of the new method in Part (3.1) in which we will explain all the steps required in report on the defined of the new method...

2.1.7INSTALL AND MAINTAIN:

To install the new method we need to gaining the acceptance of the change by supervisor getting approval of management, gaining the acceptance of change by workers and trade unions and being close contact with the progress of the job until it is satisfactorily executed.

To maintain the new method we should follow the progress of the method and not be allowing for worker to slip back, and collect periodical reviews of the method and suggestions, reactions from workers and supervisors and monitor the differences between the new written standard practice and the actual practice and analysis the reasons of variations . finally we can make changes in the method due to valid reasons.

INSTALL:

Now that we have done all the steps of method study and have determined the new method, which is much better than the old method, we have carried out the install stage as follows:

1- We got the change accepted by the supervisor.
2- We obtained management approval.
3- We have won acceptance of change by workers and unions.
4- We trained the operators on the new method.
5- We will be in close contact with the progress of the job so that it is executed satisfactorily, production increases and time and effort are reduced.

MAINTAIN :

- The work study man must see that the new introduced method is followed.
- The workers after some time may slip back to the old methods. This should not be allowed.
- The new method may have defects. There may be difficulties also. This should be rectified in time by the work study man. Periodical review is made.
- The reactions and suggestions from workers and supervisors are noted. This may lead to further improvement.
- The differences between the new written standard practice and the actual practice are found out. Reasons for variations are analyzed.
- Changes due to valid reasons are accepted. The instructions are suitably modified.

WORK MEASUREMENT

TIME STUDY

2.2 APPLYING WORK MEASUREMENT :

2.2.1 SELECT

We chose this case to modify and improve the existing time, because there is a lot of wasted time for both the worker and the machine, and we will strive in these steps to make the process faster and with the least effort possible.

2.2.2 OBTAIN AND RECORD

We have a qualified worker who is supervising the machine's work, but there are many unnecessary movements of the worker, which lead to an increase in the operation time. Also, a distributing tool affects in a negative way due to its size not suitable for the size of the basin, in addition to that, the location of the tool is far from the place where it will be used, and the discharging of sawdust is carried out in a traditional way. All of these aspects affect time.

2.2.3 BREAKDOWN

In this step, we divided the work into several components to make the time calculation more accurate.

2.2.4 EXAMINATION

After we breakdown the process into small elements, in this step we examine all the elements to achieve the goal of reducing time as well as repetitive and unnecessary movements at work. We found that "some worker movements to and from the machine" are wasting time, so we deleted them, and we strive to improve the process until the desired goal is achieved.

2.2 APPLYING WORK MEASUREMENT :

2.2.5 MEASURE

Measure the time by means of a stopwatch taken by the operator to perform each small work elements of the operation:
We have already measured each step of the clapboard making process using the stopwatch technique on our mobiles for each step in the process and then noted them under the Observed Times (OT) column in the Time Study Forum table. Then we collected the OT values for each process element (per row) under the Total OT column.

2.2.6 ASSESS PERFORMANCE RATING

While doing step 5 (measuring time with a stopwatch), we evaluated the effective working speed of the operators relative to the observer's concept of normal speed, we noticed that each element cycle of the component had a varying rating it was repetitive and there were unnecessary movements that the operator and took time like the process of checking the temperature and pressure for the machine.

2.2.7 CALCULATION OF BASIC TIME (NORMAL TIME)

The time taken by a worker with standard performance. Basic time is calculated from the observed time by applying the rating factor.
We have calculated the base time (BT) and written it down in the time study forum table, using the following law:
Basic time= Observed time×(Observed Rating)/(Performance Rating)
The Performance Rating (Standard Rating) is what is common for performance around our local area, it is 100% in this case.

2.2 APPLYING WORK MEASUREMENT :

2.2.8 DETERMINE ALLOWANCES (RELAXATION AND PERSONAL)

Various types of allowance include Rest and personal allowance, Process allowance, Policy allowance. The worker cannot work all day continuously because he will need time to rest to go to the toilet and drink water and so on. Also, unavoidable delays may occur, such as machine breakdowns and so on. So we added some 6% overtime to the base time. As shown in the time study forum table: (Allowance= 6%)

2.2.9 CALCULATE THE STANDARDS TIME FOR THE OPERATION FOR THE DEFINED JOB OR OPERATION:

Is the total time in which a job should be completed at standard performance (the sum of basic time and allowances). We calculated the standard time and recorded the results in the last column of the Standard **Time Forum table, using the following formula:**
Standard Time= (Basic Time)/(1- Allowances)

2.2.10 TIME STUDY FORUM TABLE OF THE OLD METHOD:

Time study forum			
Department: Woodworking		**Section:**	Study No:01 Sheet No: 01 of 01
Operation: Sawdust shaping **Part/Machine:** **Tool and gauges: Sawdust spreader**		**MS No:** **No:**	Time of: Time on: Elapsed time:
Product/Part: **DWG No:**		**No:01** **Material:**	Operative: unknown name Clock No:
Quality:		**Working:**	Studied by: Team 7 Date:24/4/2022 Checked: ----

EL No	Element (description)	Observation Time (OT): 1	2	3	4	Total OT	Average OT	PR	BT	% Allow	Standard Time
1	emptying the sawdust into the machine basin	20	18.8	19	19.5	77.3	19.32	100%	19.32	6%	**20.553**
2	going to get the tool	7	8	7	6.7	28.7	7.17	100%	7.17	6%	**7.628**
3	Distribute the sawdust using the tool	1.48	2	2.3	1.5	7.28	1.82	100%	1.82	6%	**1.936**
4	Given the other worker the tool	3	3	2.9	4	12.9	3.225	100%	3.225	6%	**3.431**
5	The other worker settled the sawdust on the edges of the basin	5	6	5.5	4.9	21.4	5.35	100%	5.35	6%	**5.691**
6	Giving the main worker the sawdust spreader	2.8	3	3	2.5	11.3	2.8	100%	2.8	6%	**2.979**
7	The main worker checked the evenness of the sawdust with the spreader	5	4.9	4.8	4.5	19.2	4.8	100%	4.8	6%	**5.106**
8	The worker operates the wood pressing for shaping	11.9	11.5	11.8	13	48.2	12.05	100%	12.05	6%	**12.819**
9	Waiting for the machine to shape the wood	60	58	57.9	58	233.9	58.5	100%	58.5	6%	**62.234**
10	Going to the control panel	11	10.2	9.9	8	39.1	9.77	100%	9.77	6%	**10.394**
11	Checking the temperature and pressure of the machine	30	29	28.9	28.7	116.6	29.15	100%	29.15	6%	**31.011**
12	Back in front of the machine	11	9.9	9.8	10	40.7	10.17	100%	10.17	6%	**10.819**
13	Waiting for the machine to shape the wood	32.1	31.5	30.9	30.6	125.1	31.27	100%	31.27	6%	**33.266**
14	The worker walked to the machine control panel	10	10.4	10.5	9.9	40.8	10.2	100%	10.2	6%	**10.851**
15	Open the forming machine	11.7	10.9	12.1	11.8	46.5	11.625	100%	11.625	6%	**12.367**
16	Check wood tenacity	14.9	15.6	16	16	62.5	15.625	100%	15.625	6%	**16.622**
17	Main worker and auxiliary worker lift the decorative wood board from the forming machine	8.2	7.3	7.8	6.9	30.2	7.55	100%	7.55	6%	**8.032**
18	Transfer the wood plank with the other boards	6	4.9	4.8	4.9	20.6	5.15	100%	5.15	6%	**5.479**
19	The worker walked to the machine control panel	4.9	4.9	4.8	5	19.6	4.9	100%	4.9	6%	**5.213**
20	stop the forming machine	6.9	7	7	5.9	26.8	6.7	100%	6.7	6%	**7.128**

Total Standard Time = $273.56 \text{ sec} = \frac{273.56}{60} = 4.56 \text{ Minutes}$ (4:56 Minutes)

Product Per Hour = $\frac{60 \times 60}{\text{Total Standard Time}} = \frac{60 \times 60}{273.56} = 13.16$ Product/Hour

2.2.11 TIME STUDY FORUM TABLE OF THE NEW METHOD:

TIME STUDY FORUM			
DEPARTMENT: WOODWORKING		**SECTION:**	Study No:01 Sheet No: 01 of 01
OPERATION: SAWDUST SHAPING **PART/MACHINE:** **TOOL AND GAUGES: SAWDUST SPREADER**		**MS NO:** **NO:**	Time of: Time on: Elapsed time:
PRODUCT/PART:	**NO:01**		Operative: unknown name
DWG NO:		**MATERIAL:**	Clock No:
QUALITY:		**WORKING:**	Studied by: Team 7 Date:24/4/2022
			Checked: ----

EL NO	Element (description)	Observation Time (OT): 1	2	3	4	Total OT	Average OT	PR	BT	% Allow	Standard Time
1	emptying the sawdust bags into the machines basin	17.6	17.9	18	17.7	71.2	17.8	100%	17.8	6%	18.936
2	Getting the tool	5.9	5.4	5.3	6	21.7	5.425	100%	5.425	6%	5.771
3	Distribute the sawdust using the tool also Distribute it on the edges of the basin	8.2	9	9.1	8.5	34.8	8.7	100%	8.7	6%	9.255
4	The main worker checked the evenness of the sawdust with the spreader	4.3	4.2	4.6	5	18.1	4.525	100%	4.525	6%	4.814
5	The worker operates the wood pressing for shaping.	11	10.9	10.8	10.2	42.9	10.72	100%	10.72	6%	11.404
6	Waiting for the machine to shape the wood	56	56.9	57	55.9	225.8	56.45	100%	56.45	6%	60.053
7	Assessment worker Checking the temperature and pressure of the machine in the control panel	28	28.8	28.3	29	114.1	28.525	100%	28.525	6%	30.346
8	Waiting for the machine to shape the wood	28.7	29	28.9	29	115.6	28.9	100%	28.9	6%	30.745
9	The assessment worker reaches the control panel	7.9	8	7.9	7.5	31.3	7.825	100%	7.825	6%	8.324
10	Open the forming machine	11.1	12	10.9	11.3	45.3	11.325	100%	11.325	6%	12.048
11	Check wood tenacity	16	14	14.9	14.8	62.7	15.675	100%	15.675	6%	16.676
12	Main worker and auxiliary worker lift the decorative wood board from the forming machine	8.2	9	7.9	6	31.1	7.775	100%	7.775	6%	8.271
13	Transfer the wood plank with the other boards	4.3	4.4	4	5	17.7	4.425	100%	4.425	6%	4.707
14	The assessment worker reach the control panel	4.2	4	3.8	3.9	15.9	3.975	100%	3.975	6%	4.229
15	stop the forming machine	6.9	6.9	6.8	7	27.6	6.9	100%	6.9	6%	7.340

Total Standard Time = $232.92\text{sec} = \frac{232.92}{60} = 3.88$ Minutes ? (3:88 Minutes)

Product Per Hour = $\frac{60 \times 60}{\textit{Total Standard Time}} = \frac{60 \times 60}{232.92} = 15.46$ Product/Hour

3. RESULTS AND DISCUSSION

After conducting a work study on the current methods and analyzing them well, we obtained some results, and we reached a set of improvements. Firstly, as the Flow Process Chart shows, there were some unnecessary transformation process of things by workers and accordingly one of this processes were shortened to avoid unnecessary movement. Second, The workers time and effort was saved so because we proposed to change the design of the work place to facilitate the movement of the worker and the sequence of operations and We also suggested that more reliance be placed on machines, and this Reduce of the effort of the hand because the Operations are more dependent on machines This led to reduce The working time from 359.48 sec to 224 sec also The worker is now moving a distance of 5.4828 instead 10.96

3. 1 REPORT ON THE IMPROVED METHOD

THE REPORT

3. 2 CONCLUSIONS AND RECOMMENDATIONS:

In conclusion applying the two principle of work study method and time study ,is the best way to find the best method for doing job and determining the standard time for it. First we used motion study and implement all the steps according to our video the we noticed some reparative tasks and operations that can be combined so we did that after this we suggested number of improvements in both work method and work place after that we did a time study to the job to arrive at the standard time using short cycle time study and then analyze the data to obtain the time necessary to carry out the job so that we found out how much a worker can produce per hour