Store Arrangement Efficiency Factors[1]

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Time and Motion Study is an analysis of methods, materials, and tools and equipment used for a job. Practically every job has some parts which are not economical in terms of time and movement. A questioning attitude will show you how you can improve it.

First, you must list in sequence all the steps necessary to do a job.

Second, break down each operation into separate parts.

Third, question everything about the job: the method, materials, working conditions, tools and equipment and transportation.

Answering the *six* basic questions will start you off.

1. What is done—the purpose of the operation?

2. Why is it done—is the particular operation necessary? What would happen if a particular step were eliminated?

3. Who does the work? Could it be done by some less skilled, or less highly paid.

4. Where is the work done—could it be done better elsewhere?

5. When is the work done—could it be done easier at some other time?

6. How is the work done—are there waste motions which could be eliminated?

A good way to get a picture of the job is to follow it through and write down everything as it happens. Don't trust your memory. The result is a *process chart.* Begin

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[1] From a talk given by Prof. Fox at an Extension Service Meeting in the Capitol District—the program was arranged by Charles Williams, Regional Horticultural Agent.

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with the raw material as it arrives in the shop and follow it through the steps of transporting, storage, collection for assembly, inspection and assembly, etc. until it leaves the shop as a finished product.

A Flow Diagram can be made and used along with the Process Chart. Get some squared paper and block in outlines of your shop showing desk and table space, refrigerator, sink, etc. Draw on this outline the path followed to do the job set up in your process chart. Do this while watching the job in process.

Activity Charts make a third category. This is a record of the time it takes to get ready, do a job and clear away. It has obvious benefits in bringing to light need for close storage space for most frequently needed materials.

More closely related to the individual job is the "*Simultaneous Hand Chart.*" This is a check on use of both hands. Can the left hand and the right hand be used together or is one active and the other passive? More finely detailed is a *Micro-Motion Study* which checks on small motions of the hand and fingers. This is not suited to study without expert help although a consciousness of it may serve to point out that some extra little motions are not necessary.

There are 10 major *principles of motion economy.* They are the main things you must look at and question on your flow charts and process charts.

1. *Motion of both hands simultaneous,* i.e., can you reach for scissors with one hand and ribbon with the other; reach for wire with one hand and the flower with the other?
2. *Tools and materials located close* and in front of operator to make movements as few as possible. Your work table should be arranged so that you can easily reach your basic tools and equipment such as wire, tape, corsage pins, bags, ribbons and your knife and scissors without moving. A maximum measurement of your arm reach in front and extending up over your head will give you an indication of the maximum placement. The normal work area of the hands is found when the arms are resting naturally on the table and swung in an arc across the table. Arranging for placement of basic wire, tape, scissors and knife, flowers and greens within this area will save much reaching and walking.
3. *A fixed place* for all tools and materials. It should not be necessary to think about or search for tools and equipment. A definite place permits habit forming patterns which promote automatic action. If this means buying more scissors and knives so that everyone has his own; and making arrangements for more wire storage close by, the saving of time will quickly make up the difference.
4. *Gravity feed bins.* Not so useful in the florist business. However, something like a kitchen match box holder for corsage pins could utilize this principle.
5. *Prepositioning* is the placement of tools and materials in a usable position. Putting up scissors and knives so that they can be grasped again for use is a simple example. Putting a cellophane wrapper on flowers in dozen lots is another one. Most flowers sold by the dozen could be selected more quickly if they were prepositioned in dozen lots when they are put into the refrigerator. If one lot is left open to get a single flower or 3 or 4, the rest are not disturbed.
6. *Drop Delivery.* Can be pretty well ruled out in the florist trade—except perhaps the use of a spring trap door on the table with a waste basket underneath.
7. *Let feet do the work of hands where possible.* A pedal operated sink would be a big help when it is necessary to fill cans and vases.
8. *Locate materials and tools for best sequence of motion.* If you have to drop the corsage and go over to a shelf 15 feet away to get the bow, you lose considerable time not only in getting the ribbon, but in picking up where you left off.
9. *Height of work space* should be arranged to sit or stand. Work tables should be 1 to 3″ lower than the elbow when either standing or sitting. This requires a high chair with an adjustable back rest and some kind of foot rest.

   Average height of work table
   women—37,″ men—41″
   Chair seat height—25-30″
   Space between chair seat
   and underside of table
   6″ minimum—6-10″ range

   Sometimes platforms in front of tables can be made to change height easily when new help is brought in. Tall people are especially handicapped by low work space—this evens up somewhat when the worker is seated because most length is in legs rather than the torso.

   For a seated operator, there should never be less than 33″ distance from floor to top of table. The distance from the elbow to the underside of the table should be 8″ maximum for seating. This is important when people are seated because knee space must be allowed for.

   A foot rest allowing space for the whole foot rather than just the toe or the heel is most restful.

   For good standing, have a rubber mat on the floor if the floor is concrete or tile.

   For good sitting, the chair should have a rounded, padded seat 16-17″ wide, but not over 13-17″ deep. Back rest should be 3-4″ wide, 10-12″ broad and 6-7″ above seat. It should adjust easily.
10. *Lighting.* Last of all, lighting comfort should be considered. Light of sufficient intensity, proper color and good direction must be planned for.

With these in mind you can go through your shop analyzing each operation.

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I. MATERIALS
   1. Can cheaper materials be used?
   2. Is material uniform?
   3. Materials of proper weight, size and finish?

II. HANDLING OF MATERIALS
   1. Can material handling be reduced?
   2. Can distance moved be shortened?
   3. Are there delays in getting material?
   4. Can conveyors be used to move materials?

III. TOOLS AND FIXTURES
   1. Are they the best for the work?
   2. Are they in good condition?
   3. Can both hands be used?

IV. OPERATION
   A. *Set-up*
      Type of work space?
   B. *Operation*
      1. Can operation be eliminated?
      2. Can work be done in multiple?
      3. Can sequence of operation be changed?
      4. Can two or more operations be combined?

V. OPERATOR
   1. Is operator qualified for the job?
   2. Can work conditions be changed?
   3. Can operation be improved by further instruction?

If you are really interested in saving time and money in your shop, a CHECK-UP through Time and Motion Studies is almost a sure guarantee to improvement. When you get back to your shop analyze one job such as making a rose corsage and see how you can increase the efficiency of your operation.

1965 Weather

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Table 2. The number of inches of precipitation, evaporation and snow for the 12 months in 1965.

Month	Precipitation (Inches)	Departure from Mean (Inches)	Evaporation (Inches)	Snow (Inches)
Jan.	2.17	+0.14	.....	18.2
Feb.	1.30	- 0.91	.....	3.9
March	1.79	- 0.90	.....	14.9
April	2.06	- 0.96	.....	7.0
May	1.52	- 2.17	5.50	.....
June	2.82	- 0.69	5.55	.....
July	2.16	- 1.60	6.51	.....
August	3.07	- 0.78	5.58	.....
Sept.	2.60	- 0.50	3.33	.....
Oct.	2.51	- 0.79	1.95	0.5
Nov.	2.01	- 0.90	.....	2.3
Dec.	1.49	- 0.31	.....	7.1
Sum	25.50		28.42	53.9
Mean	36.37		26.13	71.6
Departure from Mean	-10.87		+2.29	-17.7

Precipitation has been the most critical weather problem for the past few years and the reason is indicated in Table 2. Ithaca received 25.5 inches of precipitation in 1965. Ithaca's 1942-1962 average was 36.37 inches. This indicates a deficit of almost 11 inches of rain. It was also interesting to note we had below average precipitation every month except January. The snowfall was 17 inches short of the average.

Table 3. Solar radiation in gm/cal/cm² for the 12 months of 1965.

Month	
January	4080
February	4664
March	7615
April	9973
May	14536
June	14255
July	15271
August	11698
September	8403
October	5209
November	3147
December	2214
Sum	101,065

The most significant thing in table 3 were the extremely dark months of September, October, November and especially December of 1965. As a result, the total radiation for the year was below average (the average for 1950-1964 was 115,909).

Table 4. The temperature extremes in degrees F for the 12 months of 1965.

Month	High	Low
January	55	-23
February	50	-6
March	54	1
April	73	15
May	87	31
June	89	33
July	89	39
August	97	32
September	88	28
October	74	23
November	67	18
December	61	3

Table 4 indicates 1965 was a cool year. Ithaca had 30° temperatures or less every month of the year. This information agrees with table 1 which showed the average temperature.

Table 5. The date of the first and last frost in 1965.

Last freeze in spring	May 14
First freeze in fall	August 30
Days between frost	108

Table 5 indicates 1965 was a very short growing season. The normal first fall frost occurs around the 15th of September.

The most critical aspect of the 1965 weather was the lack of precipitation, in spite of the fact it was a dark, cloudy cool year. Many plants, especially large trees, have suffered great damage because of the drought; and we can only hope the weather trends will return to normal. Perhaps the blizzard of late January indicates a change.