

# Time Study and Motion Study of an Assembly Line Job (Manual) Done by a Worker Exploring his Firo-B State

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**Abstract :** An Industrial Engineer takes time study and motion study on a manual job done by a worker without knowing his FIRO-B state. Sometimes there is conflicts between them. The author suggests that the time study man should explore his ego state before taking the study of a manual job like fitting in the assembly line. The author gives details of techniques to draw FIRO-B-GRAPH of the working person. When the worker is in a group of say 5 persons, he has to earn the incentive in the group. We need to choose the worker based on his interpersonal relationship with other members. FIRO-B consideration is an additional requirement for the time study man.

**Keywords:** FIRO-B, Wanted inclusion (WI), Wanted control (WC), Wanted affection (WA), Expressed inclusion (EI), Expressed control (EC), Expressed affection (EA)

## I. INTRODUCTION

In the FIRO-B ( Fundamental Interpersonal Relationship Orientation – Behaviour ) state graph each point in the X- axis defines “EI”, “EC”, “EA”, “WI”, “WC” and “WA”.

Y axis relates the score of individual worker. We join all the points(x,y) by straight lines only

## II. PROCEDURE

- a) The worker is given 54 numbers of questions. He will show how frequently he behaves against

### Explanation with an example

Show how frequently you behave in each of the following ways by placing a cross(x) mark in the proper column opposite each item.

KEY : Usually = 1, Often = 2, Sometimes = 3, Occasionally = 4, Rarely = 5, Never = 6

| Sr. No. | Behaviour  | 1 | 2 | 3 | 4 | 5 | 6 |
|---------|--|---|---|---|---|---|---|
| 1       | I try to be with people  |   |   | X |   |   |   |
| 2       | I let other people decide what to do                           |   |   |   | X |   |   |
| 3       | I join social groups   | X |   |   |   |   |   |
| 4       | I try to have close relationships with people                  |   | X |   |   |   |   |
| 5       | I tend to join social organisations when I have an opportunity |   | X |   |   |   |   |
| 6       | I let other people strongly influence my actions               |   |   | X |   |   |   |
| 7       | I try to be included in informal social activities             |   | X |   |   |   |   |
| 8       | I try to have close, personal relationship with people         |   |   | X |   |   |   |
| 9       | I try to include other people in my plan                       | X |   |   |   |   |   |
| 10      | I let other people control my actions                          |   | X |   |   |   |   |
| 11      | I try to have people around me                                 |   |   | X |   |   |   |
| 12      | I try to get close and personal with people                    | X |   |   |   |   |   |

each question by placing a cross (X) in the proper column.

- b) Now that he has filled up the questionnaire, the scores can be calculated.  
c) Then the points in the graph paper can be plotted.  
d) The points are joined by straight lines  
e) The FIRO-B graph of the person/worker is obtained.

|    |  |   |   |   |   |   |   |
|----|--|---|---|---|---|---|---|
| 13 | When people are doing things together I tend to join them      |   | X |   |   |   |   |
| 14 | I am easily led by people                                      |   |   | X |   |   |   |
| 15 | I try to avoid being alone                                     | X |   |   |   |   |   |
| 16 | I try to participate in group activities                       | X |   |   |   |   |   |
| 17 | I try to be the dominant person when I am with people          |   |   |   | X |   |   |
| 18 | I like people to invite me to things                           |   | X |   |   |   |   |
| 19 | I like people to act close towards me                          | X |   |   |   |   |   |
| 20 | I try to have other people do things the way I want them to do |   |   | X |   |   |   |
| 21 | I like people to invite me to join in their activities         | X |   |   |   |   |   |
| 22 | I like people to act cool and distant towards me               |   |   |   |   | X |   |
| 23 | I try to influence strongly other people's actions             | X |   |   |   |   |   |
| 24 | I like people to include me in their activities                |   | X |   |   |   |   |
| 25 | I like people to act close and personal with me                | X |   |   |   |   |   |
| 26 | I try to take charge of things when I am with people           |   | X |   |   |   |   |
| 27 | I like people to invite me to participate in their activities  | X |   |   |   |   |   |
| 28 | I like people to act distant towards me                        |   |   |   |   |   | X |
| 29 | I try to have other people do things the way I want them done  | X |   |   |   |   |   |
| 30 | I try to take charge of things when I am with people           |   | X |   |   |   |   |

For sr. No 31 to 54 follow the following KEY.

KEY : Most people = 1, Many people = 2, Some people = 3, A few people = 4, One or two people = 5, Nobody = 6

| Sr. No. | Behaviour   | 1 | 2 | 3 | 4 | 5 | 6 |
|---------|---|---|---|---|---|---|---|
| 31      | I try to be friendly with people                              | X |   |   |   |   |   |
| 32      | I let other people decide what to do                          |   | X |   |   |   |   |
| 33      | My personal relations with people are cool and distant        |   |   |   |   |   | X |
| 34      | I let other people take charge of things                      |   |   |   | X |   |   |
| 35      | I try to have close relationships with people                 | X |   |   |   |   |   |
| 36      | I let other people strongly influence my actions              |   |   | X |   |   |   |
| 37      | I try to get close and personal with people                   |   | X |   |   |   |   |
| 38      | I let other people control my actions                         | X |   |   |   |   |   |
| 39      | I act cool and distant with people                            |   |   |   |   |   | X |
| 40      | I am easily led by people                                     |   | X |   |   |   |   |
| 41      | I try to have close, personal relationship with people        | X |   |   |   |   |   |
| 42      | I like people to invite me to things                          |   | X |   |   |   |   |
| 43      | I like people to act close and personal with me               |   |   | X |   |   |   |
| 44      | I try to influence strongly other people's actions            | X |   |   |   |   |   |
| 45      | I like people to invite me to join in their activities        |   | X |   |   |   |   |
| 46      | I like people to act close towards me                         | X |   |   |   |   |   |
| 47      | I try to take charge of things when I am with people          |   |   | X |   |   |   |
| 48      | I like people to include me in their activities               |   | X |   |   |   |   |
| 49      | I like people to act cool and distant towards me              |   |   |   | X |   |   |
| 50      | I try to have other people do things the way I want them done | X |   |   |   |   |   |
| 51      | I like people to ask me to participate in their discussions   |   | X |   |   |   |   |
| 52      | I like people to act friendly towards me                      | X |   |   |   |   |   |
| 53      | I like people to invite me to participate in their activities | X |   |   |   |   |   |
| 54      | I like people to act cool and distant towards me              |   |   |   |   | X |   |

Now that you have filled up the questionnaire, let us score as explained below.

Check your response to serial no 1 in your FIRO-B form. If your response is either 1-2-3 you can see that it matches with the numbers given against serial no 1 in the “EI” column. In which case underline no 1 as given below:

1.- 1 2 3

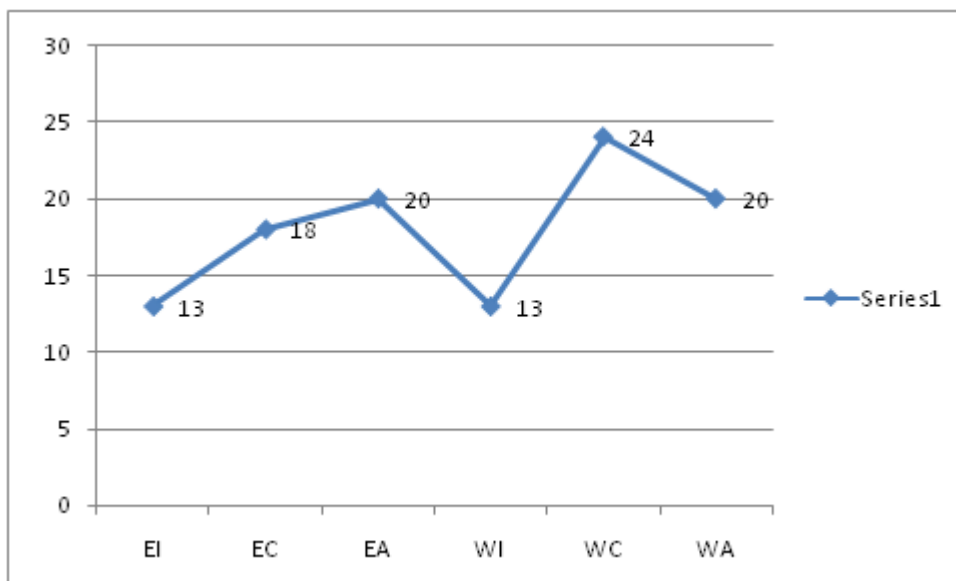
Next proceed to serial nos 3,5,7 .....and score in the same fashion until you finish column “EI” . Subsequently , score the other five columns in the same manner . The rule is, if your response matches any one of the numbers against that serial no in the scoring manual underline & if it does not match, leave it alone.

**SCORING MANUAL**

| EI           | EC          | EA        | WI       | WC          | WA      |
|--------------|-------------|-----------|----------|-------------|---------|
| 1.—1 , 2 , 3 | 44.-1,2,3   | 4.-1,2    | 42.- 1,2 | 2.-1,2,3,4  | 43.-1,2 |
| 3.—1,2,3,4   | 47.-1,2,3   | 8.-1,2    | 45.-1,2  | 6.-1,2,3,4  | 46.-1,2 |
| 5.—1,2,3     | 50.-1,2     | 12.- 1    | 48.-1,2  | 10.-1,2,3   | 49.-5,6 |
| 7.—1,2,3     | 17.-1,2,3,4 | 31.—1,2   | 51.-1    | 14.-1,2,3   | 52.-1,2 |
| 9.—1,2       | 20.-1,2,3   | 33.-4,5,6 | 53.-1    | 32.-1,2,3,4 | 54.-5,6 |
| 11.—1,2      | 23.-1,2,3   | 35.-1,2   | 18.-1,2  | 34.-1,2,3,4 | 19.-1   |
| 13.—1,2      | 26.-1,2     | 37.-1,2   | 21.-1,2  | 36.-1,2,3,4 | 22.-5,6 |
| 15.—1        | 29.-1,2     | 39.-4,5,6 | 24.-1,2  | 38.-1,2,3   | 25.-1,2 |
| 16.—1        | 30.-1,2     | 41.-1,2   | 27.-1,2  | 40.-1,2,3   | 28.-5,6 |

**SCORES**

|    |                        |
|----|------------------------|
| EI | 3+1+2+2+1+0+2+1+1 = 13 |
| EC | 1+3+1+4+3+1+2+1+2 = 18 |
| EA | 2+0+1+1+6+1+2+6+1 = 20 |
| WI | 2+2+2+0+1+2+1+2+1 = 13 |
| WC | 4+3+2+3+2+4+3+1+2 = 24 |
| WA | 0+1+0+1+5+1+5+1+6 = 20 |



**GRAPH -1: FIRO-B LINE GRAPH OF A WORKER**

**III. SUGGESTIONS TO TIME STUDY MAN**

The FIRO-B graph of the worker who is doing manual work i.e fitting in the assembly line is shown above and it is self explanatory.

The author from his experience dealing with workers can suggest the followings

FIRO-B STATE OF WORKER IN THE TIME STUDY IS AS FOLLOWS

EI = 13 WORKER EXPRESSES THAT PEOPLE SHOULD JOIN HIM IN HIS ACTIVITY

EC = 18 WORKER EXPRESSES THAT HE WANTS TO CONTROL THE ACTIVITY

EA = 20 WORKER EXPRESSES THAT HE GIVES AFFECTION IN THE MATTER

WI = 13 WORKER WANTS TO BE INCLUDED IN THEIR ACTIVITIES

WC= 24 WORKER WANTS TO BE CONTROLLED BY PEOPLE

[12] Industrial Engineering by M L KHAN (2012)

WA =20 WORKER WANTS AFFECTION IN THE MATTER.

The author considers the following for a worker to be chosen for time study ( In addition to the existing system of choosing a worker for study)

EA  $\geq$  9, EC=4 TO 6, EA  $\geq$  8, WI  $\geq$  9, WC =4 TO 6, WA  $\geq$  6

#### IV. CONCLUSION

The time study man along with HRM personnel can conduct the study and can find out the behaviour patterns of all the employees and the employee having best FIRO-B state can be rewarded.

This write up helps to find a conducive platform for improving relationship between workers and their supervisors in an organisation.

#### V. SCOPE FOR FURTHER RESEARCH

The number of questions can be increased and the FIRO-B graph can be reviewed in a periodical manner and observe the improvement.

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