

IENG301 LABORATORY 6

Exercise: Work Sampling

- Objectives:**
1. Activity and Delay Sampling: to measure the activities and delays of workers or machines, such as to determine the percentage of the day that an operator is working and the percentage of the idle time.
 2. Performance Sampling: to measure working time and non-working time of an operator on a manual task and to establish a performance index or performance level for the operator during working time.
 3. Work Measurement: to measure a manual task to establish a time standard for an operation.

Preliminary Information:

Work Sampling Procedure is the simplest form consists of making observations at random intervals of one or more operators or machines and noting whether they are working or idle.

As the number of observations affect the time and cost of making the study, determining the number of observations required is an important aspect.

$$Sp = 2\sqrt{\frac{p(1-p)}{N}} \quad (\text{confidence interval: 95\%})$$

where; S = desired relative accuracy

p = percentage expressed as a decimal

N = number of random observations (sample sizes)

Determining the standard time is another important aspect in work sampling.

$$\text{Standard time/unit} = \frac{(\text{Total time}) \times (\% \text{ Working Time}) \times (\text{Performance Index})}{\text{Units Produced}} \times \frac{100}{100 - \text{Allowances}}$$

Example:

Two workers are studied in a work sampling study for an 8 hours day. Total output during this time study is found to be 130 units. Total numbers of observations are 260 and in 39 of them the operators are idle while in 221 they are working. The performance rating and their frequencies are as shown below:

<i>Performance Rating</i>	100	110	120	130	140
<i>Frequency</i>	11	80	75	45	10

- (a) If total allowances are 20%, what is the standard time of producing one unit?
- (b) Comment on the accuracy of the study.