

Metric Calculations

Equations 1-3 express the formula on how each quantitative metric is calculated.

Task Completion Rate (TCR)

$$TCR = \frac{\text{No. of correctly completed tasks}}{\text{Total no. of attempts}} \quad (1)$$

$$\text{Total number of attempts} = \text{No. of steps} \times \text{No. of users} \quad (2)$$

$$\text{Average TCR per Step} = \frac{\text{Total no. of successful users per step}}{\text{Total number of users}} \quad (3)$$

Error Rate (ER)

$$ER = \frac{\text{No. of errors}}{\text{Total no. of attempts}} \quad (4)$$

Time-based Efficiency (TCR)

$$\text{Task time} = \text{Time Task Ended} - \text{Time Task Started} \quad (5)$$

$$\text{Time – based efficiency} = \frac{\sum_{j=1}^R \sum_{i=1}^N \frac{n_{ij}}{t_{ij}}}{NR} \quad (6)$$

In Equation 6, N signifies the total number of tasks that users are attempting to achieve; R is the total number of individuals participating in the experiment or assessment; n_{ij} is the specific outcome of the task i when attempted by the user j ; if the user j completes the task, n_{ij} is assigned a value of 1, otherwise, 0; t_{ij} is the amount of time, measured in seconds, that user j expends to complete the task i . In cases where the task is not completed, t_{ij} measures the time elapsed until the moment the user j decides to abandon the task.