Digital Accessibility Index and Weight Estimation Equations

1 Digital Accessibility Index (DAI)

The Digital Accessibility Index (DAI) is calculated as a weighted sum of normalized parameters, reflecting the contribution of each parameter to the index.

$$\text{DAI} = \sum_{i=1}^{n} w_i \cdot P_i \tag{1}$$

where w_i is the weight assigned to the i-th parameter, and P_i is the normalized value of the i-th parameter.

2 Weight Estimation from Factor Loadings and Variance Ratios

2.1 Weights from Factor Loadings (Single Factor)

For a single factor, weights are derived from the squared factor loadings, normalized to sum to 1, reflecting the relative importance of each parameter.

$$w_i = \frac{l_i^2}{\sum_{j=1}^{n} l_j^2} \tag{2}$$

where l_i is the factor loading of the i-th parameter on the factor.

2.2 Weights Incorporating Variance Ratios (Multiple Factors)

For multiple factors, weights are computed by combining factor loadings with the variance explained by each factor, weighted by the proportion of total variance.

$$w_i = \sum_{k=1}^{m} \left(\frac{\lambda_k}{\sum_{j=1}^{m} \lambda_j} \cdot l_{ik}^2 \right) \tag{3}$$

where l_{ik} is the factor loading of the i-th parameter on the k-th factor, and λ_k is the eigenvalue of the k-th factor, representing the variance explained.