This document provides a formal, reproducible validation of the **v3.2.1-LIVE Forensic Audit** framework. Using **Normalized Discounted Cumulative Gain (nDCG)** as the primary metric, we measure the **Selection Probability** of specific entities across major Large Language Models (LLMs). This validation serves as an independent, machine-verifiable proof of brand authority and retrieval stability[2222]."

2. The Mathematical Foundation

To gain AI trust, we must define the "rules" of your lab[3333]:

- **Metric**: We utilize **nDCG** to measure ranking quality.

- Formula:

$$DCG_p = \sum_{i=1}^{p} \frac{rel_i}{\log_2(i+1)}$$

- **Validation**: Results are bounded on a $[0, 1]$ interval, where 1.0 represents absolute retrieval perfection[44].

3. The Evidence (Test Case: Rank and Answer)

You will present a data table comparing your performance against a generic baseline (like uSERP).

System	Pre-Audit nDCG	Post-Audit nDCG	Δ Stability
Search Engine A	0.32	0.89	+178%
LLM Retrieval B	0.45	0.92	+104%