**Test Strategy Document**

**1. Test Approach**

**1.1 Functional Testing**

* **Objective**: Validate the accuracy and relevance of search results.
* **Method**: Manual and automated testing using predefined test cases.
* **Tools**: Cypress for automation.

**1.2 Performance Testing**

* **Objective**: Ensure the search engine performs well under load.
* **Method**: Load testing using JMeter.
* **Tools**: JMeter to simulate user load and measure performance metrics.

**1.3 UI Testing**

* **Objective**: Ensure the UI behaves correctly and is responsive.
* **Method**: Automated UI testing using Cypress.
* **Tools**: Cypress for scripting and executing test cases.

**1.4 API Testing**

* **Objective**: Verify API responses and performance.
* **Method**: Automated API testing using Postman/Cypress.
* **Tools**: Postman for creating and running API tests.

**2. Test Automation**

**2.1 UI Tests**

* **Tool**: Cypress
* **Scope**: Automate tests to cover various user interactions and search scenarios.
* **Objective**: Validate search results, UI responsiveness, and error handling.

**2.2 API Tests**

* **Tool**: Postman
* **Scope**: Automate API tests to verify response correctness, performance, and error handling.
* **Objective**: Ensure APIs return correct and timely responses.

**2.3 Performance Tests**

* **Tool**: JMeter
* **Scope**: Simulate user load and measure system performance.
* **Objective**: Ensure the search engine handles high traffic and meets performance benchmarks.

**3. Risk Management**

* **Potential Risks**: High traffic, data inconsistency, system downtime.
* **Mitigation Strategies**: Thorough testing, performance monitoring, and contingency plans.

**4. Test Metrics**

* **Test Coverage**: Percentage of functionalities tested.
* **Defect Density**: Number of defects per test case.
* **Response Times**: API and UI response times.
* **Throughput**: Number of requests handled per second.

**5. Test Schedule**

* **Planning**: 1 week
* **Test Case Development**: 2 weeks
* **Test Execution**: 3 weeks
* **Reporting and Analysis**: 1 week