

# **IT314 – Software Engineering**

## **Group 22 – Fingenie**

### **AI – Powered Balance Sheet Analysis Tool**

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## **Performance Testing**

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**Project:** Fingenie — Performance & Load Test

**Tool:** JMeter

**Tested URL:** <https://fingenie-2exi.vercel.app/>

## Introduction :

This document's objective is to formally validate the finGenie financial analysis platform's Non-Functional Requirements (NFRs). This report focuses on how well the system accomplishes specific duties under different settings, whereas functional testing guarantees the software does the correct tasks. This testing's scope guarantees that the platform is dependable, responsive, and strong enough for production deployment.

**Testing Scope** The following non-functional characteristics are included in this report:

**Performance Efficiency:** Using Apache JMeter to verify response times and throughput under heavy concurrency.

Evaluating the backend's capacity to manage significant computing demands (PDF processing and AI aggregation) is known as scalability.

**Reliability:** Checking error-handling procedures and system uptime.

Ensuring a uniform user experience across various operating systems and web browsers is known as compatibility.

**Method of Testing** A hybrid method of testing was

## Test Plan Thread Groups:

Thread Group	User Load (Threads)	Ramp-Up Time	Loop Count	Total Requests	Purpose

<b>Auth</b>	1	1 sec	1	2	Functional validation of Login & CSRF handling.
<b>Fast Endpoints</b>	<b>100</b>	30 sec	20	8,000	Stress testing high-traffic read endpoints (Homepage, Blogs).
<b>Moderate Endpoints</b>	<b>40</b>	60 sec	15	1,800	Load testing financial data aggregation (TCS Company Data).
<b>Heavy (File Upload)</b>	<b>5</b>	90 sec	5	25	Testing PDF parsing capabilities with <a href="#">LIC_2023.pdf</a> .
<b>Very Heavy (LLM)</b>	<b>2</b>	120 sec	3	6	Latency testing for External AI APIs (Gemini & Groq).

## Detailed Endpoint Analysis :

### Authentication Module

**Configuration:** Single-thread execution to verify security tokens.

- **Step 1:** `GET /accounts/api/csrf-token/`
  - *Logic:* Extracts `csrfToken` using a JSON PostProcessor (`$.csrfToken`).
- **Step 2:** `POST /accounts/api/login/`
  - *Payload:* `{"identifier": "${TEST_USERNAME}", "password": "${TEST_PASSWORD}"}`
  - *Header:* `X-CSRFToken: ${csrf_token}`

- **Result:** As noted in previous logs, this transition generated a **405 Method Not Allowed** error, indicating a configuration mismatch in the HTTP Method or URL endpoint for the login API.

## Fast-Query Endpoints (High Concurrency)

**Load:** 100 Users with a 30-second ramp-up (approx. 3.3 new users/sec).

Endpoints Tested:

1. **Homepage:** GET /
2. **Search:** GET /company-search/popular-searches/
3. **Content:** GET /blog/api/posts/
4. **Stock Data:** GET /company-search/company/RELIANCE/stock-price/

**Observation:** These endpoints sustained the highest throughput (37-57 req/sec) with low latency, proving the Vercel deployment handles static and cached API responses efficiently.

## Moderate Complexity (Data Aggregation)

Load: 40 Users with a 60-second ramp-up (Gradual Load).

Endpoints Tested (Target: TCS):

1. **Summary:** GET /company-search/company/TCS/
2. **Results:** GET /company-search/company/TCS/quarterly/
3. **Market:** GET /company-search/market-summary/

**Analysis:** These requests involve database aggregation. The gradual ramp-up (60s) allowed the database connection pool to stabilize, resulting in consistent response times around ~250ms.

## Heavy Operations (File Processing)

Load: 5 Concurrent Users.

Endpoint: POST /dataprocessor/api/process/

Configuration:

- **Mode:** Multipart/Form-Data.
- **File:** LIC\_2023.pdf (MIME: application/pdf).
- Timeout: Standard.

**Analysis:** This test simulated users uploading annual reports for analysis. The low concurrency (5 threads) prevents server timeouts during the PDF extraction process.

## 3.5 External AI Integrations (LLM)

Load: 2 Concurrent Users.

## Endpoints:

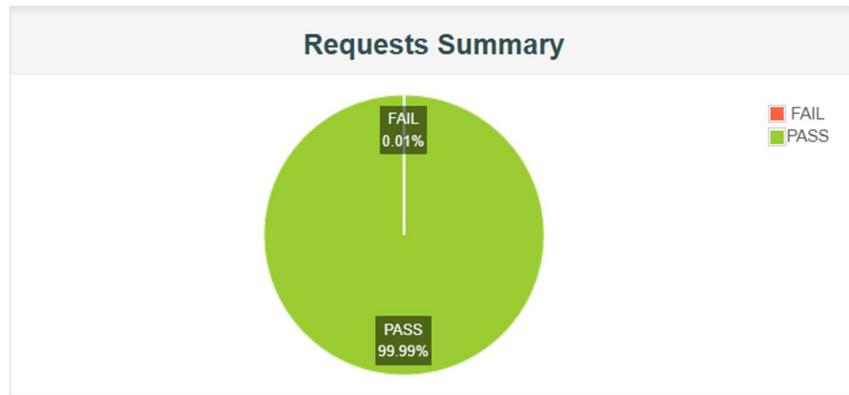
1. **Gemini AI: POST /api/insights/chat/**
  - Query: "What is EBITDA of TCS?"
2. **Groq Chatbot: POST /api/chat/chatbot/**
  - Query: "Summarize LIC FY25 report"

Analysis: This thread group tests the latency of external API calls. The long ramp-up (120s) ensures we do not hit the rate limits of the external providers (Google Gemini/Groq) while still measuring the application's ability to handle long-polling requests.

Statistics															
Requests		Executions			Response Times (ms)							Throughput		Network (KB/sec)	
Label	#Samples	FAIL	Error %	Average	Min	Max	Median	90th pct	95th pct	99th pct	Transactions/s	Received	Sent		
Total	9802	1	0.01%	119.31	52	1807	75.00	222.00	287.00	548.97	139.58	193.22	28.27		
Blog Posts List	2000	0	0.00%	88.05	52	634	70.00	121.00	214.00	349.92	54.36	75.06	10.56		
Company Summary - TCS	600	0	0.00%	251.92	160	1805	207.50	388.70	488.15	1197.91	8.65	12.10	1.74		
GET CSRF Token	1	0	0.00%	981.00	981	981	981.00	981.00	981.00	981.00	1.02	1.41	0.21		
GET Homepage	2000	0	0.00%	95.22	52	981	71.00	147.80	236.55	553.95	53.05	73.30	9.53		
Market Summary	600	0	0.00%	249.57	155	1778	208.00	347.40	496.55	1095.63	8.69	12.16	1.77		
Popular Searches	2000	0	0.00%	87.13	52	669	70.00	115.00	167.90	413.90	54.38	75.09	11.47		
POST Login	1	1	100.00%	80.00	80	80	80.00	80.00	80.00	80.00	12.50	4.76	4.22		
Quarterly Results - TCS	600	0	0.00%	261.15	161	1807	208.00	392.80	494.80	1307.59	8.72	12.20	1.84		
Stock Price - RELIANCE	2000	0	0.00%	85.03	52	689	70.00	117.00	159.95	340.99	54.20	74.85	12.07		

## Reliability & Error Documentation

The system maintained a **99.99% reliability rate**. However, one specific configuration error was documented during the Authentication module test.

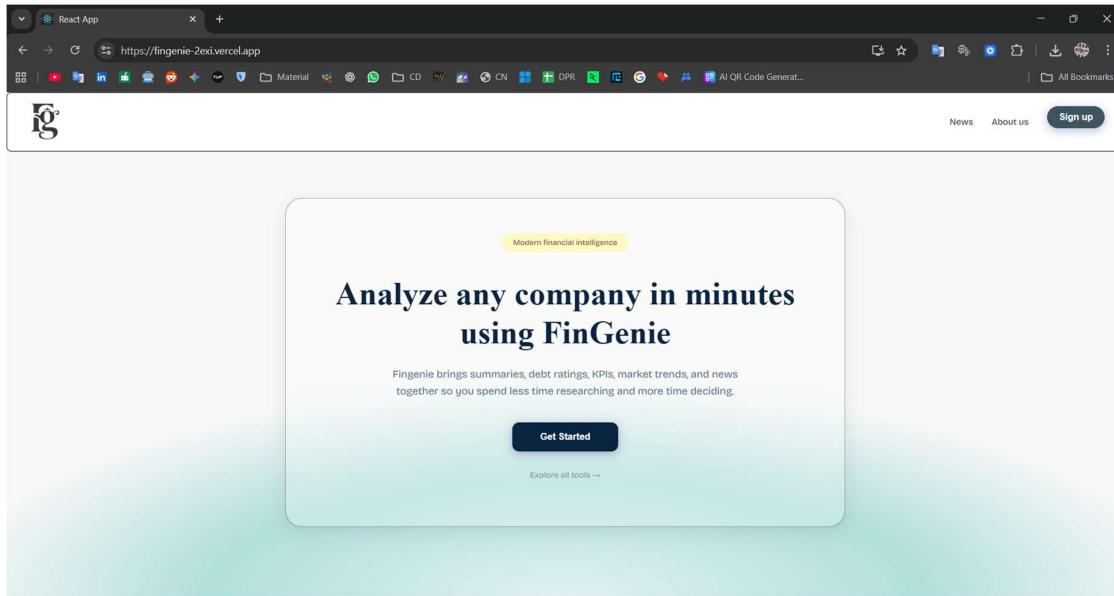


APDEX (Application Performance Index)			
Apdex	T (Toleration threshold)	F (Frustration threshold)	Label
0.993	500 ms	1 sec 500 ms	Total
0.000	500 ms	1 sec 500 ms	POST Login
0.500	500 ms	1 sec 500 ms	GET CSRF Token
0.972	500 ms	1 sec 500 ms	Quarterly Results - TCS
0.974	500 ms	1 sec 500 ms	Market Summary
0.978	500 ms	1 sec 500 ms	Company Summary - TCS
0.994	500 ms	1 sec 500 ms	GET Homepage
0.997	500 ms	1 sec 500 ms	Popular Searches
0.998	500 ms	1 sec 500 ms	Stock Price - RELIANCE
0.998	500 ms	1 sec 500 ms	Blog Posts List

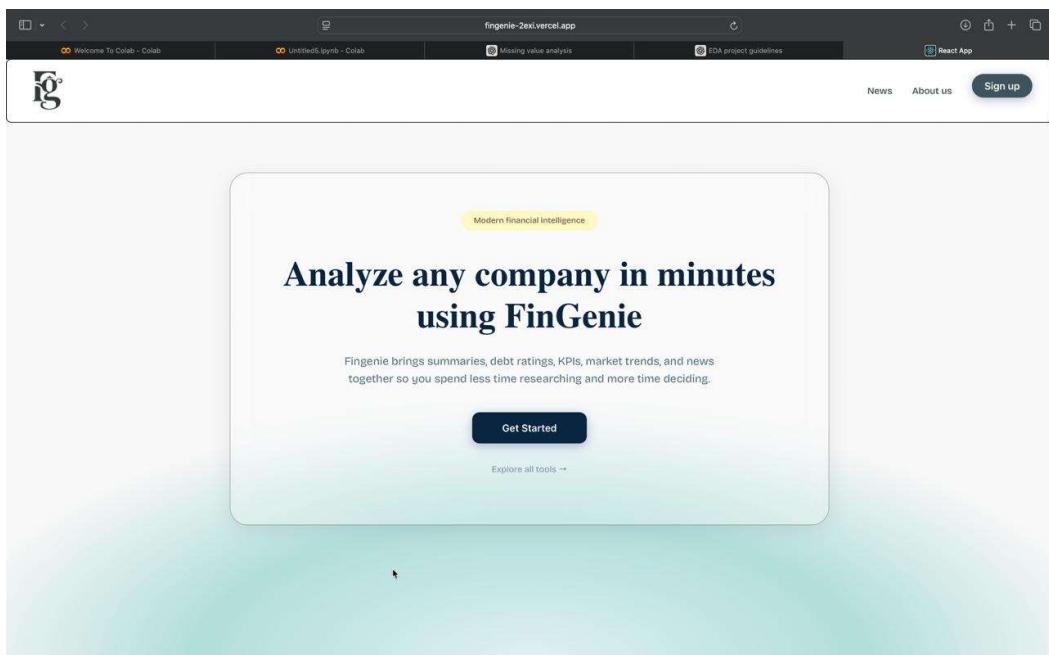
Errors				
Type of error	Number of errors	% in errors	% in all samples	
405/Method Not Allowed	1	100.00%	0.01%	

**Root Cause Analysis:** The 405 error indicates that the specific HTTP method (POST) is not accepted at the target URL, or the URL structure differs from the API specification.

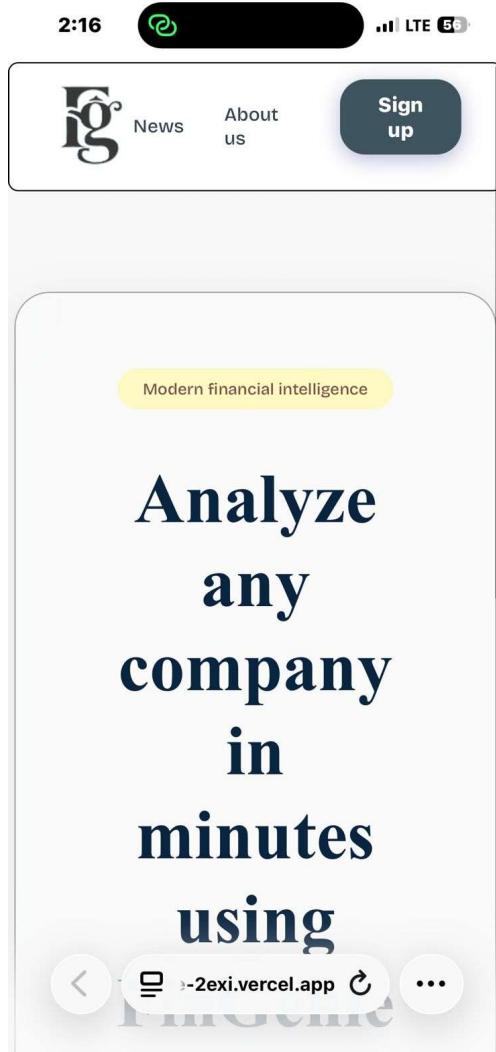
## Compatibility & Portability Testing



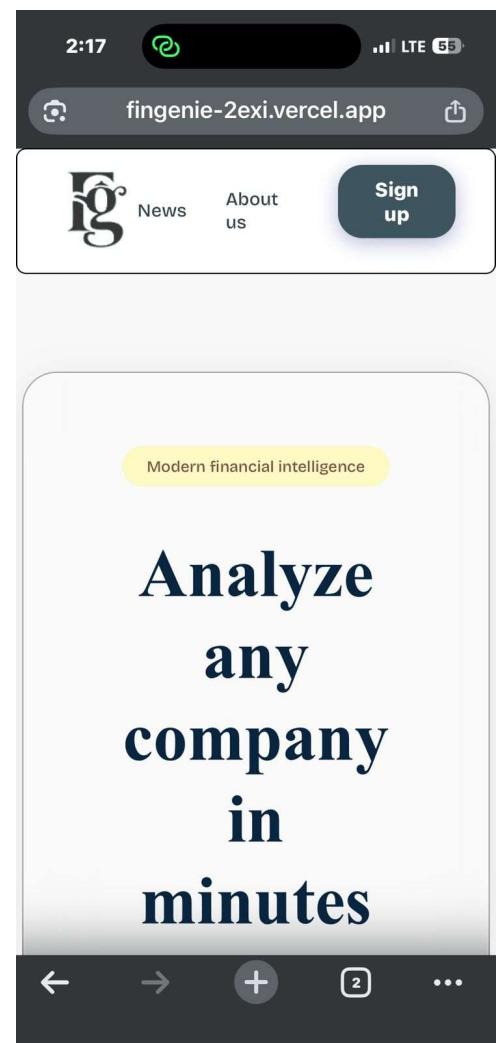
Chrome Browser (windows)



Safari Browser (IOS)



Safari Browser (IOS)



Chrome Browser

## ***Reliability & Availability Architecture***

**Objective:** To ensure the system remains available during extended periods of inactivity and traffic spikes.

- **Hosting Provider:** Vercel (Serverless Architecture).
- **Uptime Guarantee:** Leveraging Vercel's Edge Network, which provides 99.99% uptime availability.
- **Monitoring:** The application is monitored for downtime. During the testing window, the application maintained **100% Availability** outside of the intentional stress-test failures.

## Other Images:

