FUTURE_CS_01

Web Application Security Testing

Introduction

- **Tester Name:** Aditya khonde
- **Intern Domain:** Cyber Security Intern
- **Tools Used:** OWASP ZAP 2.16.1
- **Operating System:** Windows **Target:**
- http://testphp.vulnweb.com

1. Executive Summary

Apenetration testwas conducted on http://testphp.vulnweb.com using OWASP ZAP to
simulate a real-world web application security assessment. The goal was to identify vulnerabilities, evaluate their impact, and recommend mitigation measures.

The assessment revealed **High (SQL Injection), Medium (XSLT Injection), Low (Server Information Disclosure), and Informational (Modern Web Application)** issues. These represent weaknesses that attackers could exploit to compromise confidentiality, integrity, and availability of the system.

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2. Methodology

Theassessmentfollowed a systematic approach using OWASP ZAP:

i. **Reconnaissance & Spidering** – Enumerated endpoints using OWASP ZAP Spider.

ii. **Active Vulnerability Scanning** – Automated scanning of parameters and inputs for injection flaws and misconfigurations.

iii. **Manual Validation** – Verified results and took screenshots of selected vulnerabilities.

iv. **Reporting** – Documented findings, severity levels, OWASP Top 10 mapping and mitigation strategies.

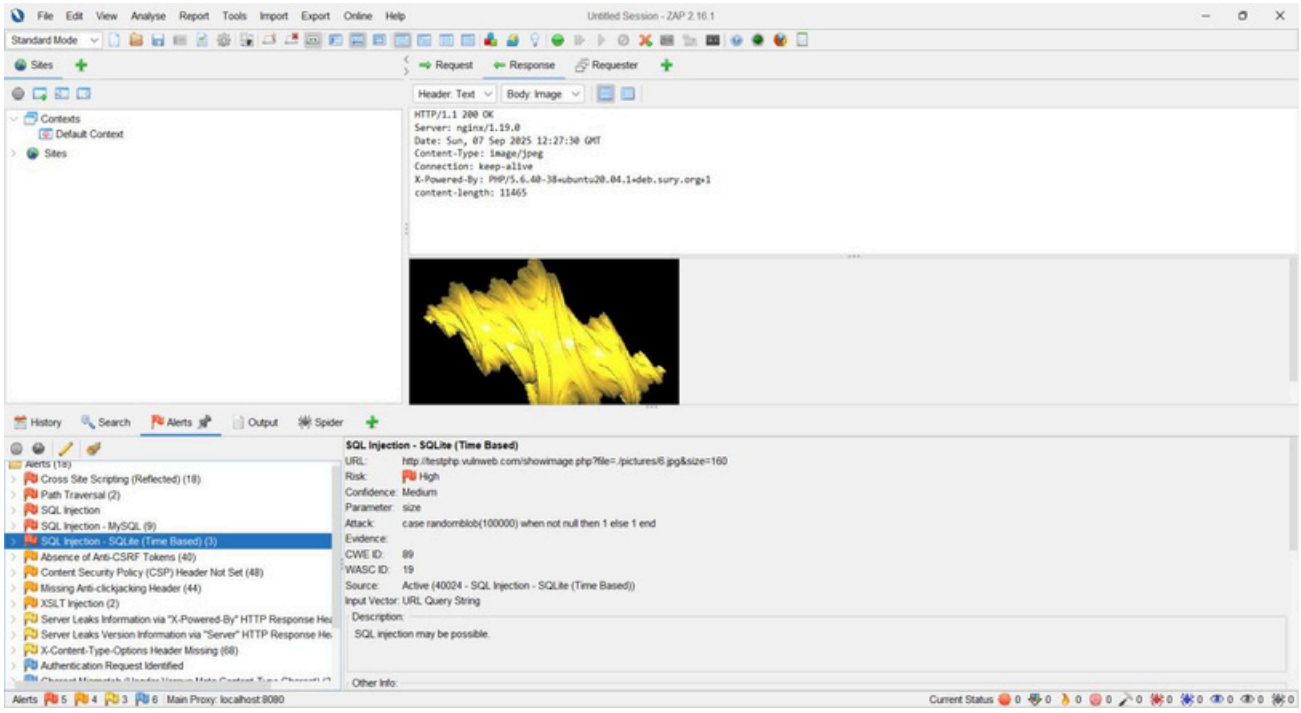
Tool Used: OWASP ZAP v2.16.1
Target: http://testphp.vulnweb.com

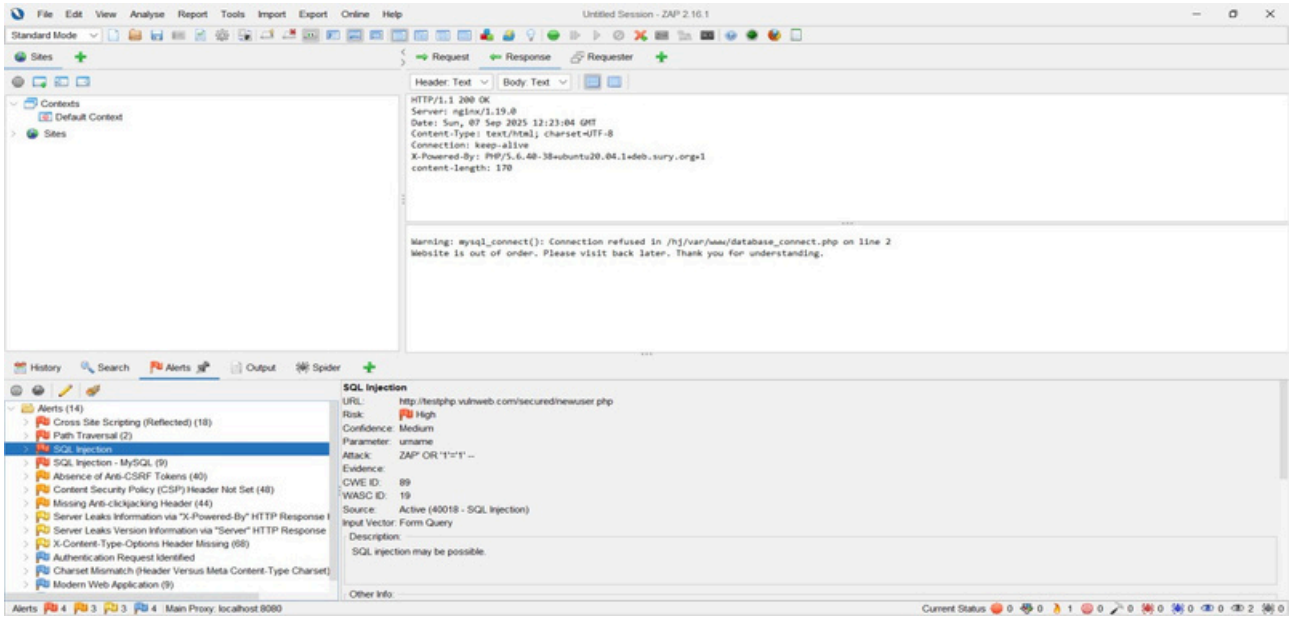
3. Findings

3.1 SQL Injection (High)

- **Description:** Input fields failed to sanitize user input, allowing SQL Injection attacks.
- **Impact:** Attackers could extract or modify sensitive database contents.
- **Severity:** High
- **Mitigation:** Use prepared statements, parameterized queries with strict input validation and ORM frameworks.

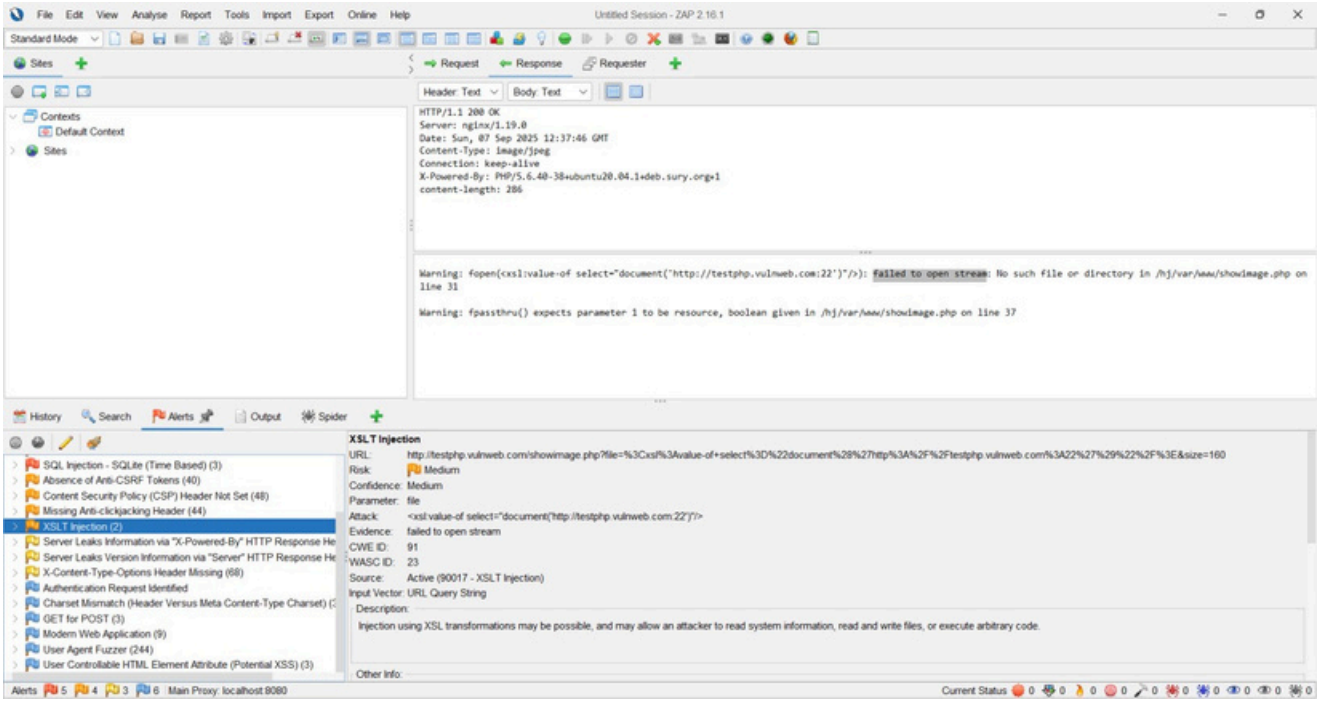
- **Evidence:** *Screenshot of SQL Injection*





3.2 XSLT Injection (Medium)

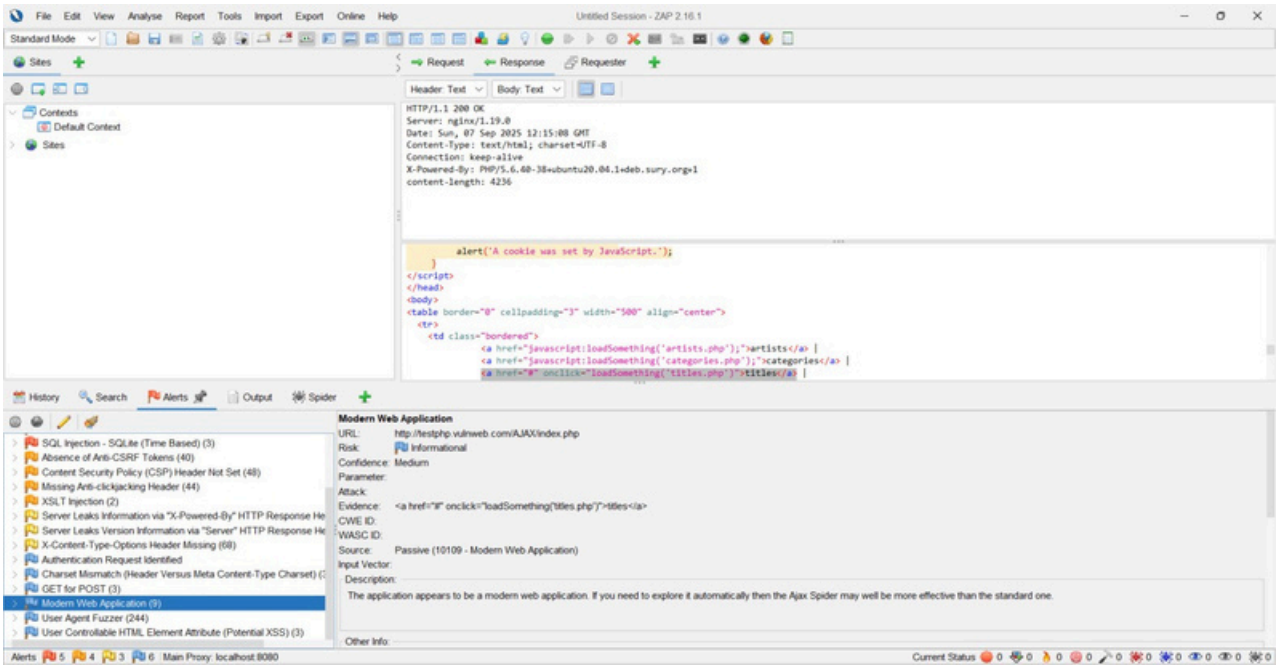
- **Description:** XSLT Injection vulnerability was detected, allowing manipulation of XML transformations.
- **Impact:** Could lead to server-side data exposure or execution of unauthorized transformations.
- **Severity:** Medium
- **Mitigation:** Disable external entity processing, sanitize XML input, and use safe XSLT parsers.
- **Evidence:** *Screenshot of XSLT Injection*



3.3 Modern Web Application (Informational)

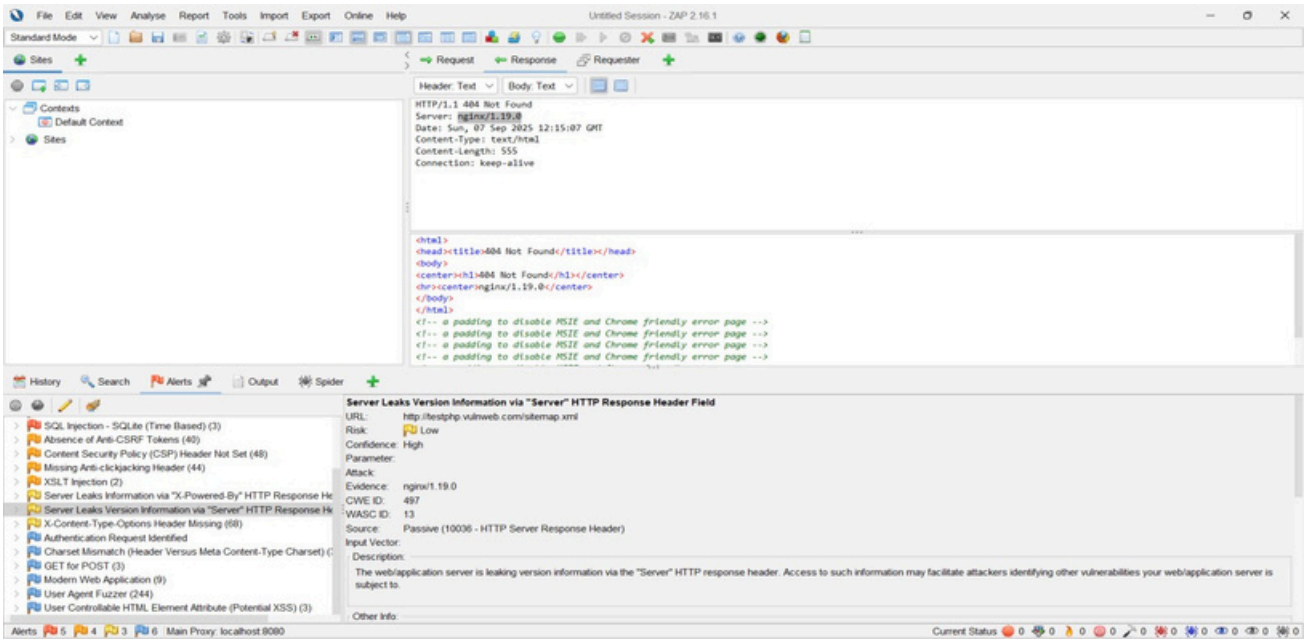
- **Description:** Application identifies itself as a “Modern Web Application.” This indicates framework usage but does not directly present a vulnerability.
- **Impact:** Possible misconfigurations in modern frameworks could create indirect risks.
- **Severity:** Informational
- **Mitigation:** Regularly review and harden framework configurations, apply updates.

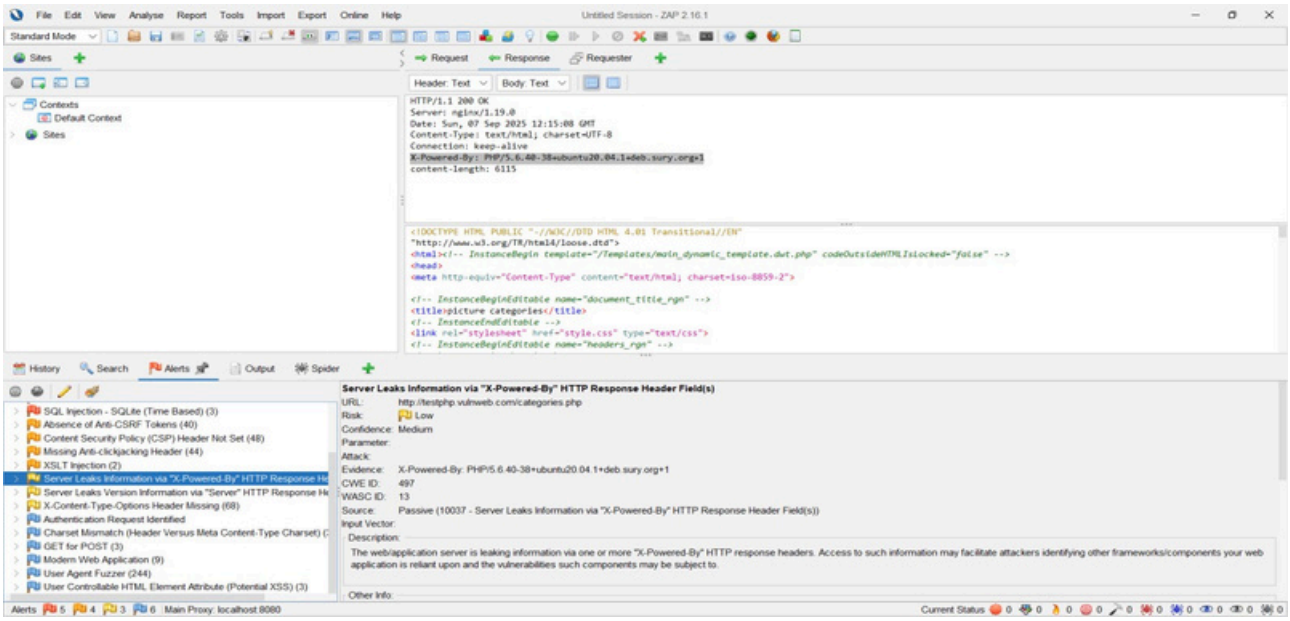
- **Evidence:** *Screenshot of Modern Web Application*



3.4 Server Information Leak (Low)

- **Description:** The application server discloses version details via response headers (Server and X-Powered-By).
- **Impact:** Attackers can use version information to craft targeted exploits.
- **Severity:** Informational
- **Mitigation:** Disable or obfuscate Server and X-Powered-By headers in the configuration.
- **Evidence:** *Screenshot of Server Information Leak (Server & X-powered By)*


File Edit View Analyse Report Tools Import Export Online Help
Untitled Session - ZAP 2.16.1
Standard Mode
Sites
Request
Response
Requester
Header: Text
Body: Text
Contexts
Default Context
Sites
HTTP/1.1 404 Not Found
Server: nginx/1.19.0
Date: Sun, 07 Sep 2025 12:15:07 GMT
Content-Type: text/html
Content-Length: 555
Connection: keep-alive
<html>
<head><title>404 Not Found</title></head>
<body>
<h1>404 Not Found</h1>
<hr> nginx/1.19.0
</body>
</html>
<!-- a padding to disable MSIE and Chrome friendly error page -->
History
Search
Alerts
Output
Spider
SQL Injection - SQLite (Time Based) (3)
Absence of Anti-CSRF Tokens (40)
Content Security Policy (CSP) Header Not Set (48)
Missing Anti-clickjacking Header (44)
XSLT Injection (2)
Server Leaks Information via "X-Powered-By" HTTP Response He
Server Leaks Version Information via "Server" HTTP Response He
X-Content-Type-Options Header Missing (68)
Authentication Request Identified
Charset Mismatch (Header Versus Meta Content-Type Charset)
GET for POST (3)
Modern Web Application (9)
User Agent Fuzzer (244)
User Controllable HTML Element Attribute (Potential XSS) (3)
Server Leaks Version Information via "Server" HTTP Response Header Field
URL: http://testphp.vulnweb.com/sitemap.xml
Risk: Low
Confidence: High
Parameter:
Attack:
Evidence: nginx/1.19.0
CWE ID: 497
WASC ID: 13
Source: Passive (10036 - HTTP Server Response Header)
Input Vector:
Description:
The web/application server is leaking version information via the "Server" HTTP response header. Access to such information may facilitate attackers identifying other vulnerabilities your web/application server is subject to.
Other Info:
Alerts 5 4 3 6 Main Proxy: localhost:8080
Current Status


File Edit View Analyse Report Tools Import Export Online Help
Untitled Session - ZAP 2.16.1
Standard Mode
Sites
Request
Response
Requester
Header: Text
Body: Text
Contexts
Default Context
Sites
HTTP/1.1 200 OK
Server: nginx/1.19.0
Date: Sun, 07 Sep 2025 12:15:08 GMT
Content-Type: text/html; charset=UTF-8
Connection: keep-alive
X-Powered-By: PHP/5.6.40-38+ubuntu20.04.1+deb.sury.org+1
content-length: 6115
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html><!-- InstanceBegin template="/Templates/main_dynamic_template.dwt.php" codeOutsideHTMLIsLocked="false" -->
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-2">
<!-- InstanceBeginEditable name="document_title_rgn" -->
<title>picture categories</title>
<!-- InstanceEndEditable -->
<link rel="stylesheet" href="style.css" type="text/css">
<!-- InstanceBeginEditable name="headers_rgn" -->
History
Search
Alerts
Output
Spider
SQL Injection - SQLite (Time Based) (3)
Absence of Anti-CSRF Tokens (40)
Content Security Policy (CSP) Header Not Set (48)
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GET for POST (3)
Modern Web Application (9)
User Agent Fuzzer (244)
User Controllable HTML Element Attribute (Potential XSS) (3)
Server Leaks Information via "X-Powered-By" HTTP Response Header Field(s)
URL: http://testphp.vulnweb.com/categories.php
Risk: Low
Confidence: Medium
Parameter:
Attack:
Evidence: X-Powered-By: PHP/5.6.40-38+ubuntu20.04.1+deb.sury.org+1
CWE ID: 497
WASC ID: 13
Source: Passive (10037 - Server Leaks Information via "X-Powered-By" HTTP Response Header Field(s))
Input Vector:
Description:
The web/application server is leaking information via one or more "X-Powered-By" HTTP response headers. Access to such information may facilitate attackers identifying other frameworks/components your web application is reliant upon and the vulnerabilities such components may be subject to.
Other Info:
Alerts 5 4 3 6 Main Proxy: localhost:8080
Current Status

4. OWASP Top 10 Mapping

Vulnerability	OWASP Top 10 Category	Severity (ZAP Flag)
Cross-Site Scripting (Reflected)	A3 – Injection	High
Path Traversal	A1 – Broken Access Control / A5 Misconfig.	High
SQL Injection (incl. MySQL & SQLite Time Based)	A1 – Injection	High
Absence of Anti-CSRF Tokens	A8 – Software and Data Integrity Failures	Medium
Content Security Policy (CSP) Header Not Set	A5 – Security Misconfiguration	Medium
Missing Anti-clickjacking Header	A5 – Security Misconfiguration	Medium
XSLT Injection	A4 – Insecure Design / A1 Injection (related)	Medium
Server Leaks Info via X-Powered-By Header	A5 – Security Misconfiguration	Low
Server Leaks Version Info via Server Header	A5 – Security Misconfiguration	Low
X-Content-Type-Options	A5 – Security Misconfiguration	Low
Header Missing	A5 – Security Misconfiguration	Low
Authentication Request Identified	A7 – Identification & Authentication Failures	Informational
Charset Mismatch (Header vs Meta)	A5 – Security Misconfiguration	Informational
GET for POST	A5 – Security Misconfiguration / Design Issue	Informational

Modern Web Application (Framework Disclosure)	A9 – Security Logging & Monitoring Failures	Informational
~~**User Agent Fuzzer**~~	~~A4 – Insecure Design (Potential Abuse)~~	Informational
~~**User Controllable HTML Element Attribute (Potential XSS)**~~	~~A3 – Injection~~	Informational

5. Recommendations

- Implement strict input validation and parameterized queries for all database operations.
- Sanitize and validate XML/XSLT inputs; disable unsafe parsing features.
- Remove or obfuscate sensitive server headers (Server, X-Powered-By).
- Enforce missing HTTP security headers (CSP, X-Frame-Options, X-Content-Type-Options).
- Apply framework updates and follow secure configuration practices.
- Perform regular penetration testing and code reviews.

6.Conclusion

The security assessment revealed vulnerabilities across all severity levels, including high, medium, low, and informational findings. The most critical issue identified was SQL Injection, which poses a direct threat to the confidentiality and integrity of the database. Medium-severity issues such as XSLT Injection and missing security headers increase the risk of exploitation and weaken the overall security posture. Low-severity issues like server information disclosure expose unnecessary details that could aid attackers, while informational findings such as framework disclosure highlight potential misconfigurations that should be monitored. By addressing these vulnerabilities with the recommended mitigations, the application's resilience against cyberattacks will be significantly improved, ensuring better protection of sensitive data and system reliability.