SMART INDIA HACKATHON 2024

- **Problem Statement ID -** SIH1750
- **Problem Statement Title -**
  Creating a Comprehensive Web Application Fuzzer
- **Theme -** Miscellaneous
- **PS Category -** Software
- **Team ID -** 6789
- **Team Name -** Tekstatik

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FizzBuzz:

web fuzzing and resolution tools for developers

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Proposed Solution:

- Identifying, testing, and solving vulnerabilities in websites has always been a problem leading to **security risks** and **delayed deployment**.
- **FizzBuzz** is a one stop integrated platform with all tools required to ease this process efficiently thus **evolving developer experience**.
- The solution offers the following-

Chrome Extension

- detects and fuzzes client-side requests to detect vulnerabilities.
- highlights potential threats of malware injection.

CLI(Command Line Interface) Tool

- deep server-side scans for threats with custom options for fuzzing.

VS Code Extension

- on-the-go vulnerability detection and resolution mechanism.

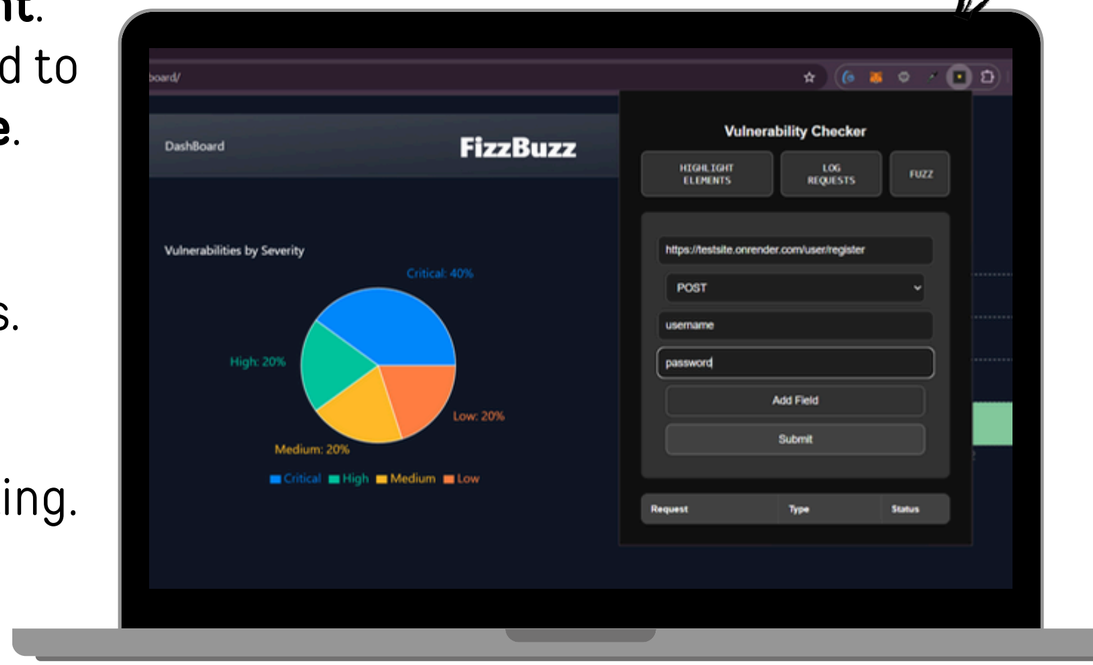
IDE Code Fixer with Generative AI

- code fixing for issues to be immediately addressed, reducing the risk.

Web Dashboard

- central hub for vulnerability data with analytics and their solutions.
- contains risk assessment of threats based on urgency of their resolution.

Chrome Extension



Progress:

70% product complete

3 tools developed

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TECHNICAL APPROACH

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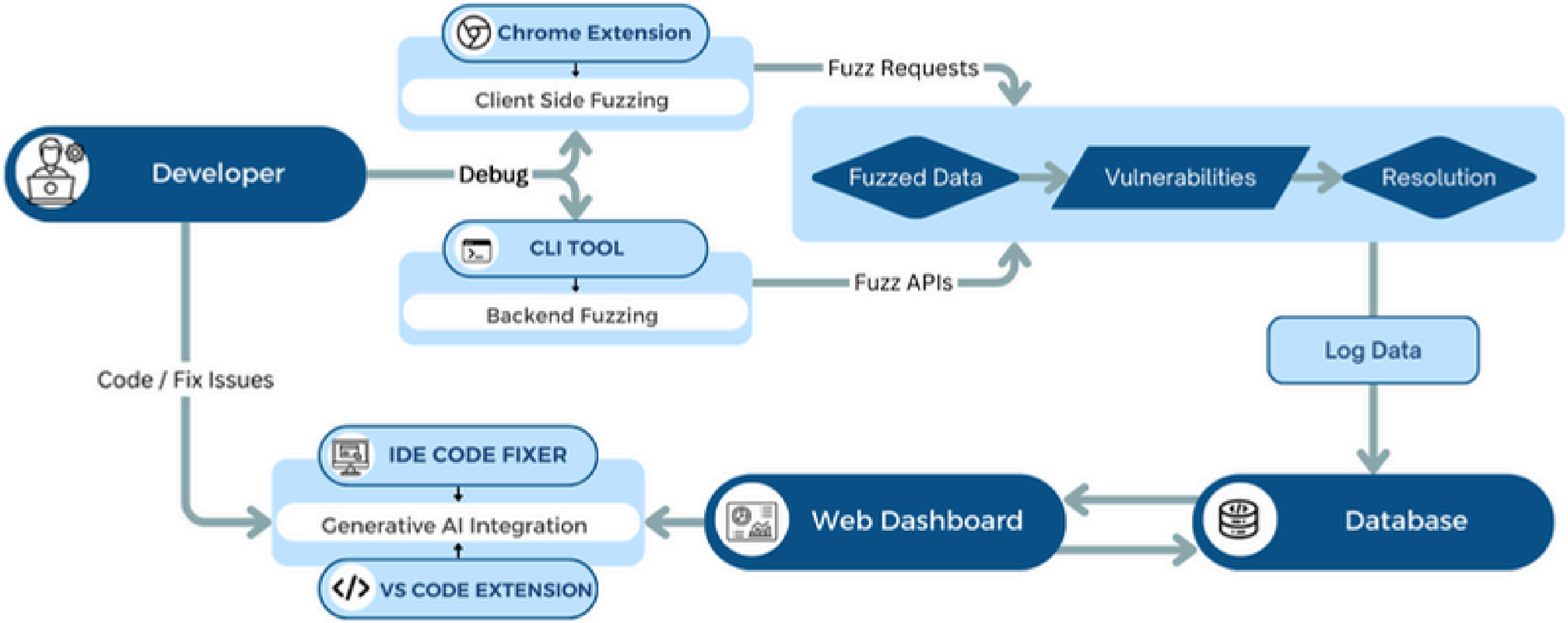

Tech Stack:

React
node JS
mongoDB
express
python
JavaScript
TensorFlow
tailwindcss
Fuzz
Gemini
Chrome Developer
Visual Studio Code

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FEASIBILITY AND VIABILITY

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Feasibility Analysis

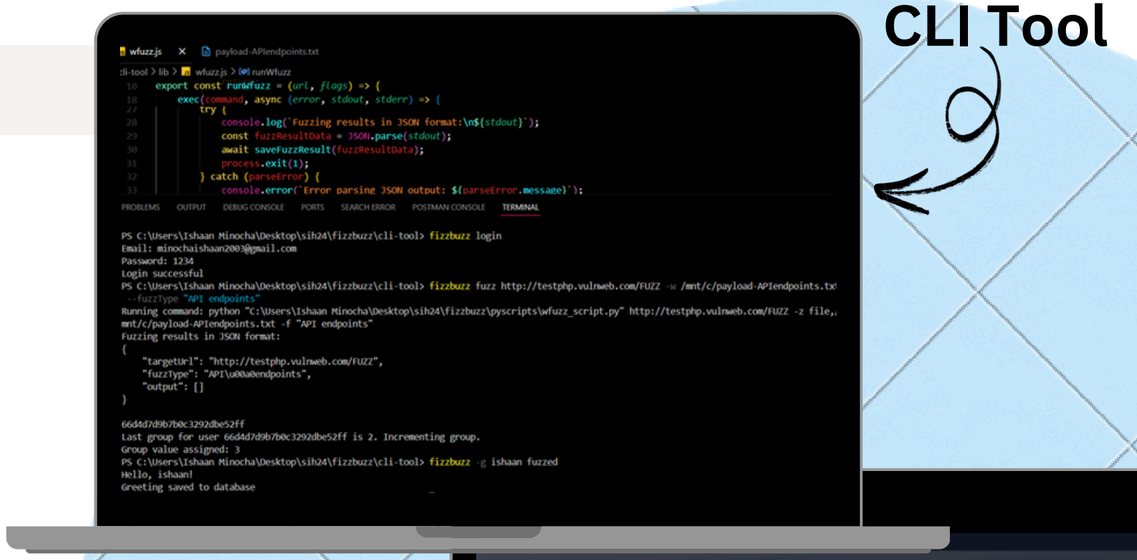
1. Efficient integration
2. Deep Fuzz Result Processing
3. Non competitive market landscape
4. Increasing Market Demand
5. Usage of established tools under the hood
6. Reduced cost and time of development
7. Robust Architecture

Potential Challenges

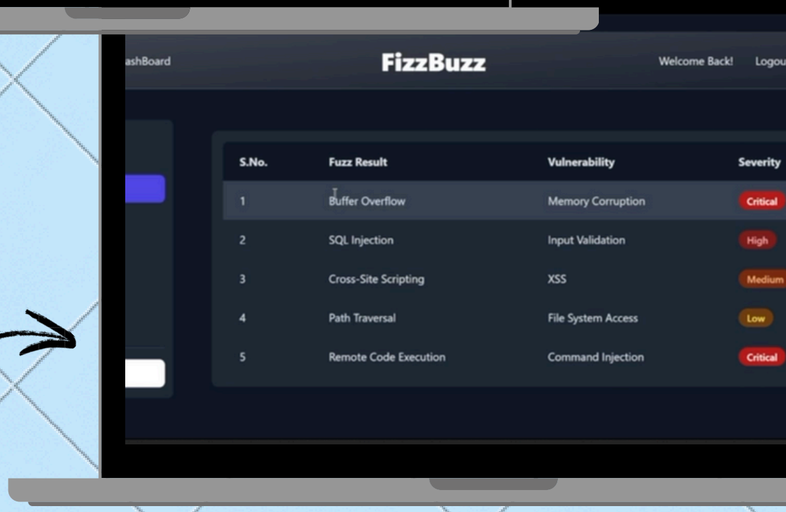
1. Performance Issues while Complex System Analysis
2. Maintenance and Upgradation according to Market
3. Varying Code practices Among Developers
4. Incorrect code solutions generated by AI
5. Usage Adoption

Viable Strategies

1. Developer friendly
2. Fully customizable testcases
3. Customizable payloads
4. Follow Modular Approach
5. One stop functionality
6. Demand for security
7. Optimized fuzzing algorithms



CLI Tool



Dashboard

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IMPACT AND BENEFITS

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Impact:

- Application uptime increased
- Low server load
- Improved developer efficiency
- No production code breakage
- Foolproof code with good quality
- Secure code practices implemented

Benefits:

Social:
- Enhanced digital safety
- Production level knowledge

Economic:
- Cost savings
- Increased productivity

Environmental:
- Reduced resource consumption
- Efficient use of computing power

Why Us?

1. Fully Automated Process
2. Realtime Resolution using Generative AI
3. No Risk of Breaking Live Code

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RESEARCH AND REFERENCES

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Resources followed:

- https://owasp.org/www-community/Fuzzing
- https://www.csoonline.com/article/568135/9-top-fuzzing-tools-finding-the-weirdest-application-errors.html
- https://medium.com/@techmindxperts/a-comprehensive-guide-to-ffuf-for-web-security-testing-207633f98217

External tools referred:

- https://wfuzz.readthedocs.io/en/latest/
- https://github.com/ffuf/ffuf
- https://developer.chrome.com/docs/extensions/reference/api/declarativeNetRequest

Research Paper:
https://www.researchgate.net/publication/375873956_Fuzzing_Progress_Challenges_and_Perspectives

Fuzzing: Progress, Challenges, and Perspectives

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Project Links:

Youtube Video: youtu.be/IRNPbwBi-oE

Github Repo: github.com/IshaanMinocha/fizzbuzz_tekstatik

Live Demo: fizzbuzz-tekstatik.vercel.app