- PROBLEM STATEMENT ID : PS 01
- TEAM NAME : SHUBHAM RATHORE
- TEAM ID : HK -197
- TEAM MEMBERS : SHUBHAM , YASHIKA, ADITYA, SAURAV

SOLUTION DEVELOPMENT

"We followed a structured 3-phase development model: problem analysis, modular architecture design, and controlled implementation with optimization."

Phase 1 — Analysis

Parsed PS1 requirements. Identified gaps in existing tools. Scoped deliverables: Crawler, SQLi, XSS, SSTI, Header detection, Severity model.

Phase 2 — Architecture

Designed 9-layer modular system. Separation of concerns: UI independent from engine. Behavioral detection via baseline vs. mutated response comparison.

Phase 3 — Implementation

Built MutationEngine, confidence scoring, OWASP mapping, VirusTotal enrichment, and structured HTML report output.

Core Modules Delivered

- Depth-based Crawler & Attack Surface Mapper
- SQLi / XSS / SSTI / Header Modules
- Centralized MutationEngine with encoding variants
- Severity + Confidence Classifier (OWASP-aligned)
- VirusTotal API — Active + Passive hybrid intelligence

Engineering Principles

Modular by Design

Each vulnerability module is fully independent — extensible without touching core engine logic.

Controlled Scope

No JS rendering, OAST, or RCE — deliberate exclusions that demonstrate architectural maturity.

Reliability Over Speed

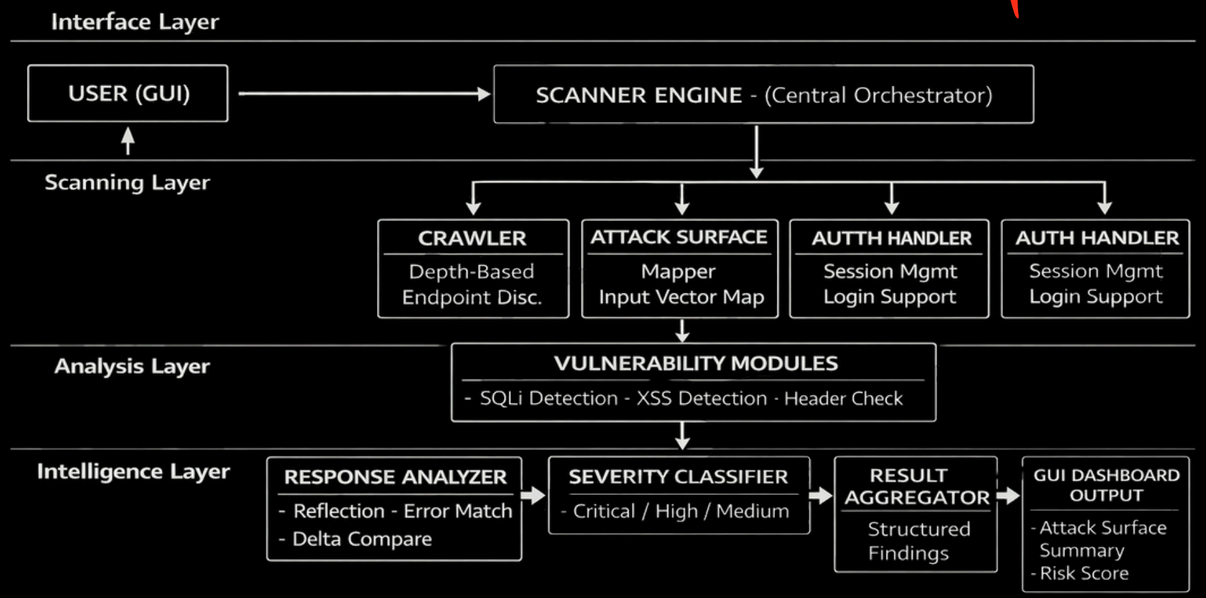
Multi-mutation confirmation reduces false positives; adaptive stopping controls overhead.

FLOW OF SOLUTION

PHASE_01

ROUND-1

FOUNDATION ARCHITECTURE



PHASE_02

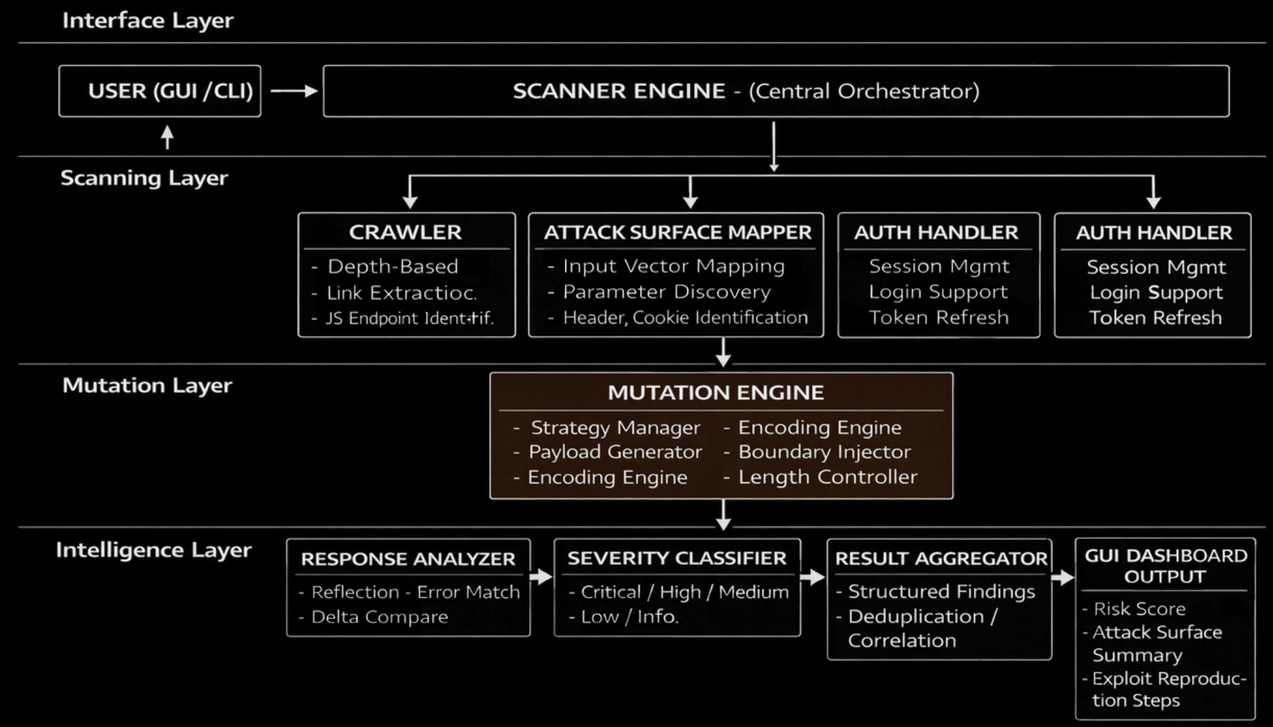
ROUND-2

INTELLIGENT OPTIMIZATION

BREAKTHROUGH TECHNOLOGY

MUTATION ENGINE

Adaptive Payload Generation

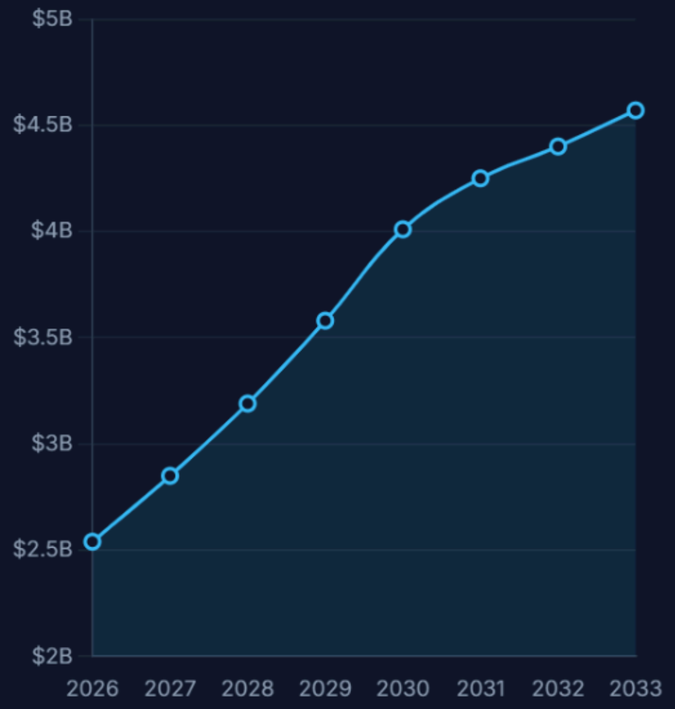


Scalability and Feasibility

Defendrix

Market Trajectory

Global Web Scanner Market Size (USD Billions)

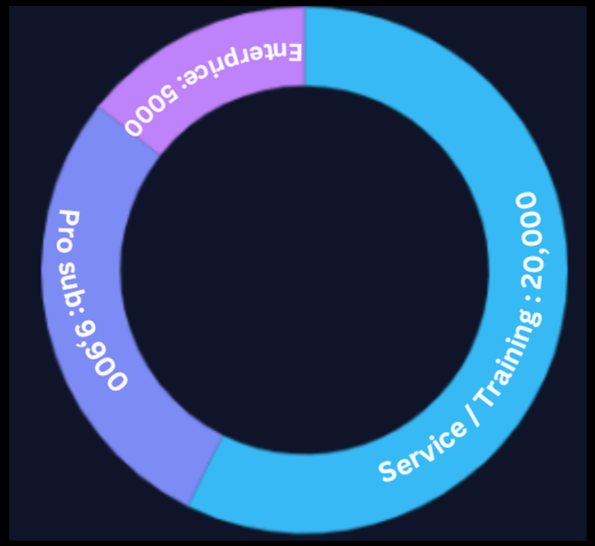


Key Insight

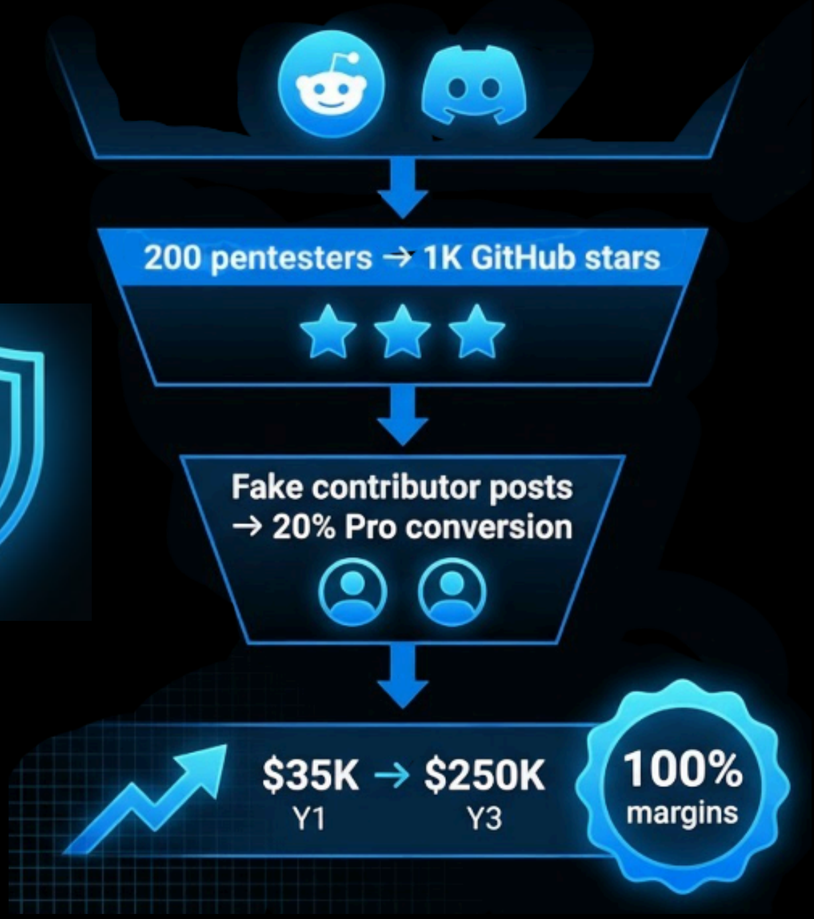
The market is projected to nearly double from **$2.54B** in 2026 to **$4.57B** by 2033.

Opportunity: 40-50% of the SME segment remains underserved due to high costs of enterprise tools.

Year 1 Revenue Mix



Services	$20.0K
Pro Sub	$9.9K
Enterprise	$5.0K
Total Y1 Projection	$34.9K



Struggling contributor persona sparks curiosity

DEPLOYMENT AND PERFORMANCE

LAYER 01

Client Interface

Desktop Security Dashboard (PySide6)

LAYER 02

Secure Communication Pipeline

Session-Based HTTP Engine

LAYER 03

Threat & Detection Engine

Core Components

TARGET ADOPTION LAYERS

Strategic Penetration Model

TIER 1: INDIVIDUAL DEVS

Open Source / Freemium Entry

TIER 2: SME & STARTUPS

SaaS Subscription / API Access

PRIMARY TARGET: 63M+ MSMEs

TIER 3: ENTERPRISE

On-Premise / Custom CI/CD

"India's 63M+ MSMEs represent a structurally underserved security segment ready for automated, low-touch defense."

SCALABILITY MECHANICS

Expansion Architecture

LOCAL DEPLOYMENT

Lightweight CLI / Browser Ext.

SaaS PLATFORM

Centralized Scanning Engine

ENTERPRISE LICENSING

Full CI/CD Integration

- Low Infra Cost
- Rapid Onboarding

REAL WORLD IMPLEMENTATION

SYSTEM STATUS: ONLINE

PROTOTYPE WALKTHROUGH

Live Website Scanning

Real-time injection testing on target URL with zero latency perception.

Instant Risk Scoring

Dynamic CVSS calculation based on detected mutation patterns.

User Alert Workflow

Immediate dashboard notification and mitigation suggestion.

Technical Capability	Defendrix	Legacy Scanners
Mutation-Based Payload Generation	Yes (structured variations)	Limited or scripted
Behavioral Response Analysis	Baseline comparison + delta analysis	Often signature-based
Confidence Scoring	Yes	Rarely explicit
Attack Surface Metrics Dashboard	Built-in	Not standardized
Modular Detection Engine	Yes	Plugin-based
Passive Threat Intelligence	Integrated	External
Performance Control	Depth-limited scanning	Full aggressive scan
Learning Capability	Architecture-ready	Limited adaptability

LIVE DEMO ENVIRONMENT

TECHNICAL SUPERIORITY

PREDICTIVE DEFENSE

Identifies attack patterns before execution, blocking zero-day vectors proactively.

MUTATION ENGINE

Adapts payload structures automatically to bypass WAF filters and find hidden flaws.

LIGHTWEIGHT CORE

Running on efficient Go/Python architecture. Minimal CPU overhead (< 2%).

FEATURE VECTOR	DEFENDRIX	W3AF	NIKTO	OWASP ZAP
Real-time Latency	< 15ms	High	Medium	Medium
False Positive Rate	< 0.1%	High	Medium	Low-Med
CI/CD Integration	Seamless	Plugin Req.	Limited	Standard
UX & Automation	Fully Auto	Complex CLI	CLI Only	Desktop GUI