SIMON AI

AGENT STUDIO MVP-1

v3.1 PRODUCTION BLUEPRINT

Version	v3.1 Final (Production-Ready)
Classification	Internal - Technical Documentation
Date	27 December 2025
Status	APPROVED FOR IMPLEMENTATION
Duration	18 Working Days
Budget	$68 (Month 1), $41/month (Steady)
Target	Q1 2025 Production Launch

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1. EXECUTIVE SUMMARY

Simon AI Agent Studio delivers end-to-end automation of the software development lifecycle through advanced AI orchestration. The system achieves 97% automation, reducing typical 2-3 day development cycles to 4-8 hours while maintaining enterprise-grade security and compliance standards.

Core Value Proposition:
• Autonomous code generation, testing, and deployment
• Browser-based UI automation with computer vision
• Multi-model AI orchestration with automatic failover
• Real-time cost tracking and budget enforcement
• Enterprise security with credential isolation
• Full audit trail for regulatory compliance

Key Metrics:
• Time to Production: 4-8 hours (vs 2-3 days manual)
• Cost: $41/month steady state (99.5% savings vs developer)
• Automation: 97% of development tasks
• Uptime Target: >95%
• ROI: Positive within 1 day

Objective	Target	Success Metric
Automation Rate	97% of tasks	Manual work <3%
Time Reduction	4-8 hours	85% faster
Cost Efficiency	$41/month	ROI <30 days
System Uptime	>95%	SLA compliance
Security	Zero incidents	GDPR compliant

2. TECHNICAL ARCHITECTURE

2.1 System Overview

The system implements a distributed, microservices architecture with six functional layers. Each layer has a single, well-defined responsibility with clear interfaces and security boundaries.

Design Principles:
• Separation of Concerns: Modular, testable components
• Defense in Depth: Multiple security layers
• Least Privilege: Minimal access rights
• Observability: Comprehensive logging and metrics
• Fault Tolerance: Graceful degradation
• Cost Awareness: Real-time budget tracking

2.2 Six-Layer Architecture Design

Layer	Component	Core Responsibilities	Tech Stack
L1: Orchestration	Task Orchestrator	Task decomposition, workflow management, API key custody, model selection, state mgmt	FastAPI PostgreSQL Redis Celery
L2: AI Gateway	LiteLLM Router	Model abstraction, request routing, failover management, token tracking, cost aggregation	LiteLLM Redis (cache)
L3: Execution	UI Runner Service	Browser automation, screenshot capture, action execution, idempotency, result packaging	Python Playwright Celery
L4: Network Security	Egress Proxy	Domain allowlisting, traffic inspection, request logging, protocol enforcement	Squid Proxy iptables
L5: Governance	Approval Gate	Risk assessment, approval workflow, timeout management, rollback coordination	WebSocket React PostgreSQL
L6: Observability	Audit & Telemetry	Structured logging, cost ledger, approval ledger, screenshot archival, metrics collection	PostgreSQL Prometheus Grafana

2.3 Data Flow Pattern

Typical Task Execution Flow:

1. Initialization: User prompt → Orchestrator → Task created → Cost estimated
2. AI Planning: Orchestrator → LiteLLM → Claude Sonnet 4.5 → Plan generated
3. Risk Assessment: Plan analyzed → HIGH risk = Approval Gate triggered
4. Execution: Sub-tasks dispatched → UI Runner (Celery workers)
5. Browser Automation: Playwright → Screenshot → Egress Proxy → Allowed domains
6. AI Iteration: Screenshot + context → Claude → Next action → Execute → Loop
7. Validation: Tests run → Results aggregated → Status updated
8. Completion: Audit logged → Cost ledger updated → User notified

Security Highlights:
• API keys NEVER reach UI Runner (credential isolation)
• All external traffic via Egress Proxy (allowlist enforcement)
• Screenshots auto-purged after 30 days (GDPR compliance)
• Every action has idempotency key (safe retries)

3. AI MODEL STACK & ORCHESTRATION

Simon AI employs a multi-model strategy, intelligently routing requests to the optimal AI based on task characteristics, cost constraints, and availability.

Model	Role	Pricing (per 1M)	Primary Use Cases	Workload %
Claude Sonnet 4.5	Primary	In: $3 Out: $15	Code generation, complex reasoning, computer use, architecture design	~70%
OpenAI GPT-4o	Failover & Vision	In: $2.50 Out: $10	Rate limit overflow, image analysis, rapid iteration, quick tasks	~10%
Ollama Qwen 2.5	Local Basic	In: $0 Out: $0	Log parsing, simple transforms, dependency analysis, formatting	~15%
Claude Opus 4.5	Premium Complex	In: $5 Out: $25	Exceptionally complex tasks, long context, advanced reasoning	~3%
OpenAI o1	Reasoning Expert	In: $15 Out: $60	Complex mathematics, formal verification, proof generation	~2%

Intelligent Model Routing:

The LiteLLM Gateway automatically routes requests based on:
• **Cost efficiency:** Use cheapest model that meets requirements
• **Availability:** Automatic failover if primary rate-limited
• **Task complexity:** Simple tasks → Ollama, Complex → Claude/Opus
• **Budget constraints:** Enforce daily/monthly spend limits
• **Performance:** Cache common prompts (90% cost reduction)

4. SECURITY & COMPLIANCE FRAMEWORK

4.1 Defense-in-Depth Architecture

Layer 1: Network Security (Egress Proxy)
• Squid proxy enforces strict domain allowlist
• Only whitelisted domains accessible (simonai.com, vercel.app, github.com)
• All traffic logged for forensic analysis
• DPI (Deep Packet Inspection) for protocol validation

Layer 2: Credential Isolation (CRITICAL)
• API keys stored ONLY in Orchestrator + LiteLLM Gateway
• UI Runner has ZERO access to any credentials
• Secrets managed via environment variables (production: HashiCorp Vault)
• Automatic key rotation every 90 days

Layer 3: Data Privacy (GDPR/KVKK)
• Screenshot TTL: 30 days automatic purge
• PII detection & masking: phone, email, credit cards
• GDPR Article 17 compliance (Right to Erasure)
• Encryption: AES-256 at rest, TLS 1.3 in transit

Layer 4: Access Control
• Role-based access control (RBAC)
• Multi-factor authentication (MFA) for production
• Session timeout: 15 minutes inactivity
• Principle of least privilege enforced

Layer 5: Audit & Compliance
• 100% action logging (structured JSON)
• Tamper-evident audit trail (append-only database)
• Cost ledger & approval ledger for accountability
• SOC 2 Type II preparation (future roadmap)

4.2 Risk Classification System

Risk Level	Example Actions	Approval Required	Timeout	Rollback Plan
LOW	read_file, analyze_code, generate_summary, format_output	No	N/A	Not required
MEDIUM	write_code, install_package, modify_config, deploy_staging	No (notify only)	N/A	Git revert, config backup
HIGH	deploy_production, modify_database, send_email, process_payment, delete_data, rotate_api_keys	YES (mandatory)	5 min	Documented rollback required

5. IMPLEMENTATION ROADMAP

5.1 18-Day Development Timeline

Days	Phase	Key Deliverables	Team	Risk
1-4	v3.1 Corrections	Egress proxy setup, credential isolation, Celery workers, audit infrastructure	2 eng	LOW
5-6	Foundation	Docker environment, LiteLLM gateway, Ollama setup, databases (PostgreSQL, Redis)	2 eng	LOW
7-8	Core Logic	Task manager, orchestrator, risk engine, model routing	2 eng	MED
9-10	Automation	UI Runner service, Playwright integration, computer use loop, idempotency	2 eng	HIGH
11-12	Frontend	Approval gate UI, WebSocket real-time updates, dashboard, cost tracking display	1 eng 1 design	MED
13-14	Observability	Structured logs, cost ledger, approval ledger, metrics, alerts	2 eng	LOW
15-16	QA	Integration tests, load tests, security scan, penetration testing	2 QA	MED
17-18	Production	Deployment, monitoring setup, runbook, stakeholder training, go-live	2 eng 1 ops	HIGH

Critical Milestones:

Day 4: Security foundation complete (egress proxy + credential isolation)
Day 10: Browser automation demo ("Google search + click first result")
Day 14: End-to-end test ("React component creation + test + approval")
Day 18: Production launch (Agent Studio live, first real task executed)

6. COST ANALYSIS & ROI

Component	Month 1	Steady State	Notes
Claude Sonnet 4.5	$50	$25	90% savings via prompt caching
OpenAI GPT-4o	$10	$8	Batch processing discounts
Ollama (Local)	$0	$0	Self-hosted, zero API cost
Egress Proxy	$4	$4	Hetzner VPS (v3.1 addition)
Hosting (Infra)	$4	$4	Vercel + Railway
TOTAL	**$68**	**$41**	**Target achieved**

Return on Investment Analysis:

Baseline Comparison:
• Traditional mid-level developer cost: $8,000/month (salary + benefits + overhead)
• Simon AI cost: $41/month (steady state)
• Savings: $7,959/month (99.5% cost reduction)

Break-Even Analysis:
• Cost per average task: ~$3-5
• Traditional developer time per task: 4-8 hours
• Break-even point: 1 task (vs 1 hour of manual work)
• Monthly capacity: 50-100 tasks automated

ROI Timeline:
• Day 1: First task completed → ROI positive
• Month 1: $7,959 savings realized
• Year 1: $95,508 total savings (minus $500 initial investment)
• 3-Year Total Savings: $286,524

IMPLEMENTATION AUTHORIZATION

This comprehensive technical blueprint has been reviewed and approved for production implementation. The architecture, security framework, cost projections, and risk mitigation strategies outlined herein meet all requirements for enterprise deployment.

Technical Validation:
■ Architecture reviewed and approved
■ Security framework meets compliance standards
■ Cost projections validated
■ Risk mitigation strategies adequate
■ Implementation timeline realistic
■ Resource allocation confirmed

Authorization Signatures:

Technical Lead: _____ Date: _____

Project Manager: _____ Date: _____

Security Officer: _____ Date: _____

Budget Approver: _____ Date: _____

Next Steps:
Upon final approval, initiate Phase 0 (Days 1-4) by executing command:
"Simon AI Agent Studio MVP-1 v3.1 Faz 0 basla."