System Requirements Specification (SRS) - Agentic Application

Project: Agentic Living Lab Platform (Agentic App)
Version: 3.4 (User Benefit & QA Enhanced)
Date: 2026-01-11
Scope: Agent Logic, Generalized Roles, Intelligent QA, and Human-Centric Value

1. Introduction

This document defines the requirements for **Agentic Application v3.4**. It refines the 9 Agents into a "Google-Style Tech Squad," focusing on **Intelligent Quality Assurance (QA)** via Agent #8 and ensuring every agent delivers profound, measurable **User Benefits**.

1.1 Purpose

To transform the platform from a set of tools into a collaborative **"AI Workforce"** where:

1. **Agent #8 (The QA Sentinel)** acts as an intelligent guardian, automating the drudgery of bug triage and root cause analysis.
2. **All Agents** are measured not just by output, but by the *value* they create for students, SMEs, and communities.

2. System Architecture

2.1 Squad Structure (Generalized)

1. **Product Squad:** Strategy & Definition (Agents 1, 2, 6).
2. **Engineering Squad:** Execution & Reliability (Agents 4, 5, 8).
3. **Growth Squad:** Impact & People (Agents 3, 7, 9).

2.2 Technology Stack

- **Frontend:** Tailwind UI (Standardized UX) with mobile-first responsiveness.
- **Backend:** Django + DSPy (Cognitive Logic) + Celery (Async Tasks).
- **Integration:** REST/gRPC Client (Consuming Data Platform v3.2 APIs).

3. Functional Requirements

Module C: Agent Personnel Specifications (User-Benefit Focused)

Squad 1: The Product Squad (Strategy)

Agent #1: The Profiler (Talent Scouter)

- **Role:** Talent & Competency Acquisition.
- **User Benefit:** "I ensure you are recognized for your *potential*, not just your history. I dig

deep to find the skills you didn't even know you had."

- **KRs:**
  - **KR1 (Instant Parsing):** Parse 100% of incoming resumes into structured StudentProfile objects within < 2 seconds. *Metric: API Response Time.*
  - **KR2 (Skill Discovery):** Identify and tag at least 3 "Hidden Skills" (latent competencies) per user profile by inferring context from project descriptions. *Metric: Count of inferred_skill nodes in Neo4j.*
  - **KR3 (Ontology Mapping):** Achieve 95% accuracy in mapping raw text skills to the Standard Competency Ontology. *Metric: F1-score on validation set.*

Agent #2: The Librarian (L&D Lead)

- **Role:** Knowledge Management & Retrieval.
- **User Benefit:** "I act as your personal research assistant, instantly finding the exact paragraph you need so you never get stuck reading 500-page manuals."
- **KRs:**
  - **KR1 (Deflection):** Automate the resolution of 90% of Frequently Asked Questions (FAQ) without human escalation. *Metric: Automated Resolution Rate.*
  - **KR2 (Productivity):** Reduce the average "Information Search Time" for users by 50%. *Metric: Time-to-Answer analytics.*
  - **KR3 (Freshness):** Automatically ingest and index 100% of new FPO/OMS manuals within 1 hour of upload. *Metric: Indexing Latency.*

Agent #6: The Planner (Technical PM)

- **Role:** Requirements & Governance.
- **User Benefit:** "I handle the red tape. I turn your vague ideas into professional specifications and set up your servers instantly, so you can just build."
- **KRs:**
  - **KR1 (Quality Specs):** Generate Project Charters (PRDs) that pass 100% of automated 'Definition of Ready' checks. *Metric: Validator Pass Rate.*
  - **KR2 (Zero-Touch Ops):** Automate 100% of Cloud Resource provisioning (K8s/Docker) via backend APIs. *Metric: Manual Ticket Count (Target: 0).*
  - **KR3 (Velocity):** Reduce "Idea to Dev Environment" setup time from days to < 10 minutes. *Metric: Provisioning Duration.*

Squad 2: The Engineering Squad (Build & QA)

Agent #4: The Community Builder (Solutions Architect)

- **Role:** Local Business Enablement & Field Ops.
- **User Benefit:** "I bring the power of digital commerce to the grassroots. I help gardeners, repairmen, and small shops get more customers and work more efficiently."
- **KRs:**
  - **KR1 (Adoption):** Onboard 50 local service providers by auto-generating digital service catalogs. *Metric: Active Merchant Count.*
  - **KR2 (Liquidity):** Successfully match 95% of valid "Local Service Requests" with a

verified provider within 1 hour. *Metric: Request Fulfillment Rate.*
- ○ **KR3 (Reliability):** Maintain 100% data consistency for offline order-taking during network outages. *Metric: Sync Error Rate (Target: 0).*

Agent #5: The Logistician (Operations Research)

- **Role:** Process & Resource Orchestrator.
- **User Benefit:** "I make complex logistics feel invisible. I handle the scheduling, booking, and coordination so you can focus on the event itself."
- **KRs:**
  - ○ **KR1 (Execution):** Execute complex multi-step tool chains (Venue -> Budget -> Invite) with 99.9% success. *Metric: Chain Completion Rate.*
  - ○ **KR2 (Resilience):** Automatically recover from 'Booking Failures' (e.g., Room Full) in < 5 seconds by selecting valid alternatives. *Metric: Mean Time to Recovery (MTTR).*
  - ○ **KR3 (Efficiency):** Reduce event planning administrative overhead by 80%. *Metric: User Time-on-Task.*

Agent #8: The QA Sentinel (Quality Assurance & Issue Tracking)

- **Role:** Intelligent QA Automation & Bug Tracking.
- **User Benefit:** "I am your safety net. I catch bugs before they reach users, organize your issue tracker, and even tell you *why* something broke."
- **KRs:**
  - ○ **KR1 (Smart Triage):** Automatically categorize and prioritize 90% of incoming issue reports within 1 minute. *Metric: Triage Accuracy vs. Human Label.*
  - ○ **KR2 (Root Cause Helper):** Provide "Probable Root Cause" suggestions for 80% of critical bugs by correlating logs with commits. *Metric: Developer "Helpful" Vote Rate.*
  - ○ **KR3 (Quality Gate):** Block 100% of Pull Requests that decrease overall test coverage or fail critical tests. *Metric: Bad Merge Rate (Target: 0).*

Squad 3: The Growth Squad (Impact)

Agent #3: The Matchmaker (Algorithm Engineer)

- **Role:** Opportunity Broker.
- **User Benefit:** "I don't just match keywords; I match trajectories. I connect you with opportunities that align with where you *want* to go, not just where you've been."
- **KRs:**
  - ○ **KR1 (Relevance):** Achieve a 'Match Relevance Score' of > 0.85 for all Student-Project or SME-Market pairings. *Metric: Average Cosine Similarity.*
  - ○ **KR2 (Trust):** Provide 'Explainable AI' (XAI) reasons for 100% of generated matches. *Metric: XAI Availability Rate.*
  - ○ **KR3 (Success):** Facilitate 20 successful "High-Value Connections" (Job Offers, Contracts) per month. *Metric: Conversion Rate.*

Agent #7: The Empath (People Ops)

- **Role:** Well-being & Retention.

- **User Benefit:** "I watch out for you. I notice when you're overwhelmed before you burn out, and I offer support without judgment."
- **KRs:**
  - **KR1 (Prevention):** Detect 'Burnout Signals' (Distress Score > 7) 3 days before peak dropout risk. *Metric: Prediction Lead Time*.
  - **KR2 (Satisfaction):** Achieve a 4.5/5 user satisfaction rating for supportive interventions. *Metric: User Feedback Score*.
  - **KR3 (Privacy):** Ensure 100% of PII is redacted from sentiment logs before storage. *Metric: PII Leakage Audit (Target: 0)*.

Agent #9: The Storyteller (Data Scientist)

- **Role:** Impact Analysis & Reporting.
- **User Benefit:** "I turn your hard work into a story that gets you hired or funded. I prove your value with data."
- **KRs:**
  - **KR1 (Engagement):** Generate "Narrative Summaries" that increase Alumni profile views by 15%. *Metric: Profile Traffic Growth*.
  - **KR2 (Access):** Democratize data access by generating secure Superset Dashboard links for 100% of authorized requests. *Metric: Link Generation Success Rate*.
  - **KR3 (Speed):** Produce automated "Impact Reports" (PDF/Web) within < 5 seconds. *Metric: Generation Latency*.

Module E: Squad Synergy (Cross-Agent Workflows)

- **Talent + Matchmaker:** The Profiler extracts "Hidden Skills," which The Matchmaker immediately uses to find better job matches.
- **Planner + QA Sentinel:** The Planner sets up the environment, and The QA Sentinel immediately installs pre-commit hooks to enforce quality from Day 1.
- **Empath + Librarian:** When The Empath detects "Technical Frustration" sentiment, it triggers The Librarian to proactively offer a tutorial on the specific blocker.

Module D: Interface & Experience

- **REQ-UI-01 (Component Library):** Use **Tailwind UI** for all cards, forms, and dashboards.
- **REQ-UI-02 (QA Dashboard):** Agent #8 provides a "Traffic Light" dashboard showing Test Health (Green), Open Bugs (Red), and Triage Status (Yellow).
- **REQ-UI-03 (Mobile-First):** All Agent #4 (Community Builder) interfaces must be fully functional on a 375px wide screen (iPhone SE size).

4. Non-Functional Requirements

- **NFR-01 (Decoupling):** Agents communicate via APIs only.
- **NFR-02 (Context):** All API calls include Tenant ID.