



SENTINEL

The Career Alignment Operating System

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PROBLEM STATEMENT

- Education and employment are decoupling
- Degrees no longer guarantee job readiness
- Students lack proof of work, only proof of attendance
- Career guidance does not scale

- Students know the goal but not the path
- Massive objectives cause paralysis
- No structured sequence of micro-actions



The result is misalignment, anxiety, and wasted potential.





SOLUTION OVERVIEW

What Sentinel Does

- Analyzes each student's profile, skills, and target role
- Maps them against real market requirements
- Identifies precise skill gaps and priority areas
- Generates structured missions to close those gaps
- Tracks growth through a measurable readiness score

Alignment Engine

Analyzes each student's multidimensional profile and matches it against real job descriptions and demand trends.

Adaptive Reality Engine

Analyzes each student's multidimensional profile and matches it against real job descriptions and demand trends.

Mission-Based Progression System

Analyzes each student's multidimensional profile and matches it against real job descriptions and demand trends.



AI ARCHITECTURE

```
User (Frontend)
|
v
API Gateway (FastAPI)
|-- Gap Workflow (Webhook-first)
|   |
|   v
|   n8n (Automation Engine)
|   |
|   v
|   Plan Normalizer + Persistence
|-- AI Intents
|   |
|   v
|   ADK Intelligence Engine
|   |
|   v
|   Multi-Agent Orchestrator (Gemini)
|       +--> ProfilingAgent
|       +--> MarketAgent
|       +--> GapAgent
|       +--> MissionAgent
|       +--> ScoringAgent
|       |
|       v
|       Deterministic Fallback Layer
```

Sentinel AI Stack

◆ Orchestrator (Gemini-powered)

- Routes intent
- Enforces pipeline order
- Generates narrative
- Never computes scores

◆ ProfilingAgent

- Normalizes skills (1-5 → 0-1)
- Extracts evidence
- Outputs skill vector

◆ MarketAgent

- Loads role catalog
- Applies demand weighting
- Outputs role vector

◆ GapAgent

- Cosine similarity
- Critical/moderate gaps
- Priority ranking

◆ MissionAgent

- Maps gaps → structured tasks
- Assigns XP
- Generates deliverables

◆ ScoringAgent

- Composite readiness formula
- Tier assignment
- Signal classification

GAP_ANALYSIS Execution Flow

```
POST /v1/analyze/gap
|
v
Validate User + Profile
|
Resolve Selected Role
|
Build Context Envelope
|
Try n8n Webhook (HMAC signed)
|
+--> Success → Normalize → Persist Plan → Return
|
+--> Failure → Call ADK Intent (GAP_ANALYSIS)
|
|       +--> Gemini Orchestrator
|       +--> Deterministic fallback if quota error
|
Persist Plan + Tasks
|
Return Normalized Response
```

Gamification Engine Architecture

```
Event (TASK_COMPLETED)
|
v
Event Processor
|
+--> Check Idempotency Log
+--> Compute XP & Coins
+--> Update Streak
+--> Update Level
+--> Update Quests
+--> Evaluate Badges
|
Commit Transaction
```




DEMO



TECHNOLOGIES

FRONT-END:

Next.js (App Router)

React (component-based)

JWT authentication

Backend (API Gateway)

- FastAPI (Python)
- REST API (/v1/*)
- JWT + bcrypt security
- SQLite persistence

AI & Intelligence Layer

- Separate ADK microservice
- Google Gemini API
- Intent-based routing

Automation

- n8n workflow engine
- Webhook-first gap analysis
- HMAC-signed requests



COMPETITIVE LANDSCAPE

Others



- Focus on one stage (résumé, interview, analytics, or job search)
- Provide generic or semi-personalized advice
- Static guidance — no continuous recalibration
- Help students apply for jobs
- Optimize applications after graduation
- No measurable readiness index

Platform	Education-	Gap	Mission-	Adaptive	Readiness
IBL.ai	✗	✗	✗	✗	✗
CareerVilla	⚠ Partial	✗	✗	✗	✗
FinalRound	✗	✗	✗	✗	✗
IBM	⚠	✗	✗	⚠ Limited	✗
CareerFlow	✗	✗	✗	✗	✗
FuturU	⚠ Trend-	✗	✗	✗	✗
SpectraSe	✗	✗	✗	✗	✗
Sentinel	✓	✓	✓	✓	✓

Sentinel



- A multi-agent AI system orchestrating career progression
- Continuously analyzes profile vs real market demand
- Detects skill gaps using quantitative alignment models
- Generates mission-based roadmaps with real deliverables
- Recalibrates dynamically as markets evolve
- Quantifies employability through a readiness score before application
- Built-in gamification layer (XP, tiers, quests, streaks) to sustain momentum

BUSINESS MODEL & SCALABILITY

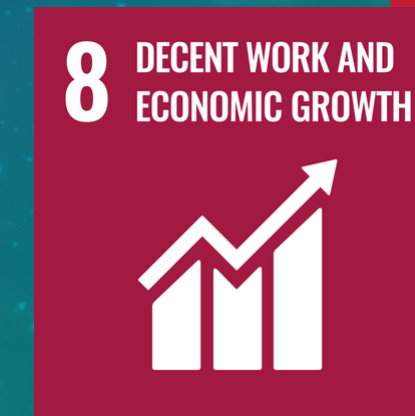
Key Partners	Key Activities	Value Proposition	Customer Relationships	Customer Segments
• Universities & Career Centers: For student onboarding and institutional integration. • Industry Experts & Mentors: To provide high-level "Human-in-the-Loop" coaching and business angel matching. • Tech Providers: API partners for job listings and skill mapping tools.	• Real-time Market Analysis: Scraping job data and skill histograms to identify trending industry needs. • AI Roadmap Generation: Building personalized missions and "Project Roadmaps" for students. • Skill Validation: Running micro-assessments and "Sidequests" to verify student competencies.	• For Students: Provides a "Career GPS" that turns theoretical degrees into "Verified Artifacts" and actionable, high-ROI daily tasks. • For Universities: An automated alignment engine that scales 1:1 career coaching to thousands of students, reducing graduate unemployment rates. • For Employers: A pipeline of "Day 1 Ready" talent with verified skills and portfolios, bypassing the noise of generic CVs.	• Automated Personalization: 24/7 AI-driven mentorship that learns and adapts to user progress. • Gamified Engagement: Building momentum through XP, levels, and "Accountability Loops". • Community & Peer Review: Facilitating soft competition and peer feedback through "Study Squads".	• University Students: High school graduates, current students, and those nearing graduation. • Career Changers/Alumni: Individuals looking to pivot into in-demand tech roles. • Educational Institutions: Universities and vocational schools struggling with low employability metrics.
	Key Resources		Channels	
	• Proprietary AI Engine: The core intelligence layer for profile analysis and pathfinding. • External Data APIs: Access to labor market insights and professional profile data. • Knowledge Base: Taxonomy of skills, regional job demand data (e.g., Tunisia 2025/2026 initiatives), and industry rubrics.		• Online Platform: API-based web and mobile application. • University Portals: Integrated dashboards for career advisors. • Professional Networks: LinkedIn integration for profile imports and social sharing of achievements.	
Cost Structure			Revenue Streams	
• AI & Technical Infrastructure: Cloud hosting, API subscription fees, and LLM tokens • Platform Maintenance: Ongoing development of the "Career RPG" and gamification layers. • Marketing & Partnerships: Costs associated with acquiring university partners and building the mentor network.			• B2B Institutional Licenses: Annual "per-seat" fees paid by universities to provide the tool to their student body. • B2C Freemium Model: Basic pathfinding is free; premium features like "Mock Interview Coach" or portfolio hosting require a subscription. • Recruitment Referral Fees: Potential revenue from connecting "Verified" high-readiness students with hiring partners.	

SOCIAL IMPACT

Engineering a Sustainable Workforce



- **SDG Alignment:**
 - SDG 8: Reducing the NEET population (Youth Not in Employment, Education, or Training).
 - SDG 4: Providing the technical and vocational skills needed for decent work.



OUR GOAL

Reduce "Time-to-First-Job" for Students/Fresh Graduates by 30% through early alignment.

LIMITATIONS:

- Role demand data is currently semi-static (full real-time labor integration in progress)
- Readiness accuracy depends on quality and completeness of user-provided data
- Early-stage employer integration (no live hiring pipeline yet)
- Institutional dashboard in initial rollout phase
- Requires consistent student engagement to maximize impact
- AI orchestration depends on external API quotas (with deterministic fallback)
- Currently optimized for tech and business tracks; expansion to other domains ongoing

FUTURE ENHANCEMENTS

Phase 1: Intelligence Expansion

Live job scraping & demand recalibration
AI-powered PFE market matcher
Behavioral analytics for engagement prediction

Phase 3: Talent Marketplace

Employer access to high-readiness candidates
Sponsored industry missions
Verified skill certification pathways

Phase 2: Institutional Scale

University analytics dashboards
Employability heatmaps
API integrations with career centers



THANK YOU

NOT THE HERO YOU WANT, BUT THE AGENT YOU NEED.

APPENDIX

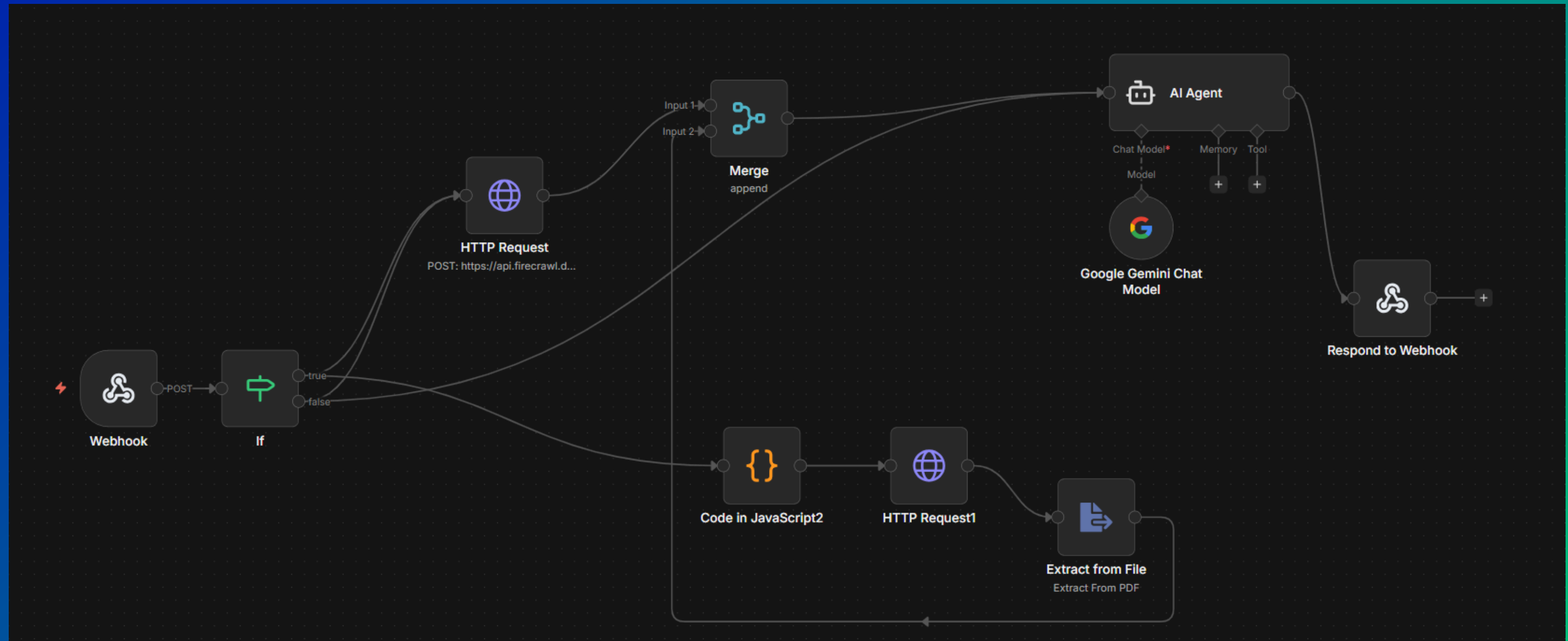
AI agent Prompts:

PROMPT OWNERSHIP SUMMARY			
#	Prompt	Type	Who Calls It
0	Career Coach Analyzer	system	External (n8n / frontend)
1	SentinelOrchestrator	system	Google ADK (LLM orchestrator)
2	ProfilingAgent	system	ADK (sub-agent)
3	MarketIntelligenceAgent	system	ADK (sub-agent)
4	GapAnalysisAgent	system	ADK (sub-agent)
5	MissionGeneratorAgent	system	ADK (sub-agent, enriches text)
6	ReadinessScoringAgent	system	ADK (sub-agent)
7	GAP_ANALYSIS runtime tpl	user message	api/ → intent_router.py
8	/analyze runtime template	user message	sentinel_404/main.py
NOTE: All numeric scores (alignment_score, readiness_score, XP values, tiers) are computed deterministically by Python tool functions – never by the LLM. Gemini only orchestrates, narrates (prompt 1), and enriches descriptions (prompt 5). This prevents hallucinated scores.			

All system prompts are provided in a log file

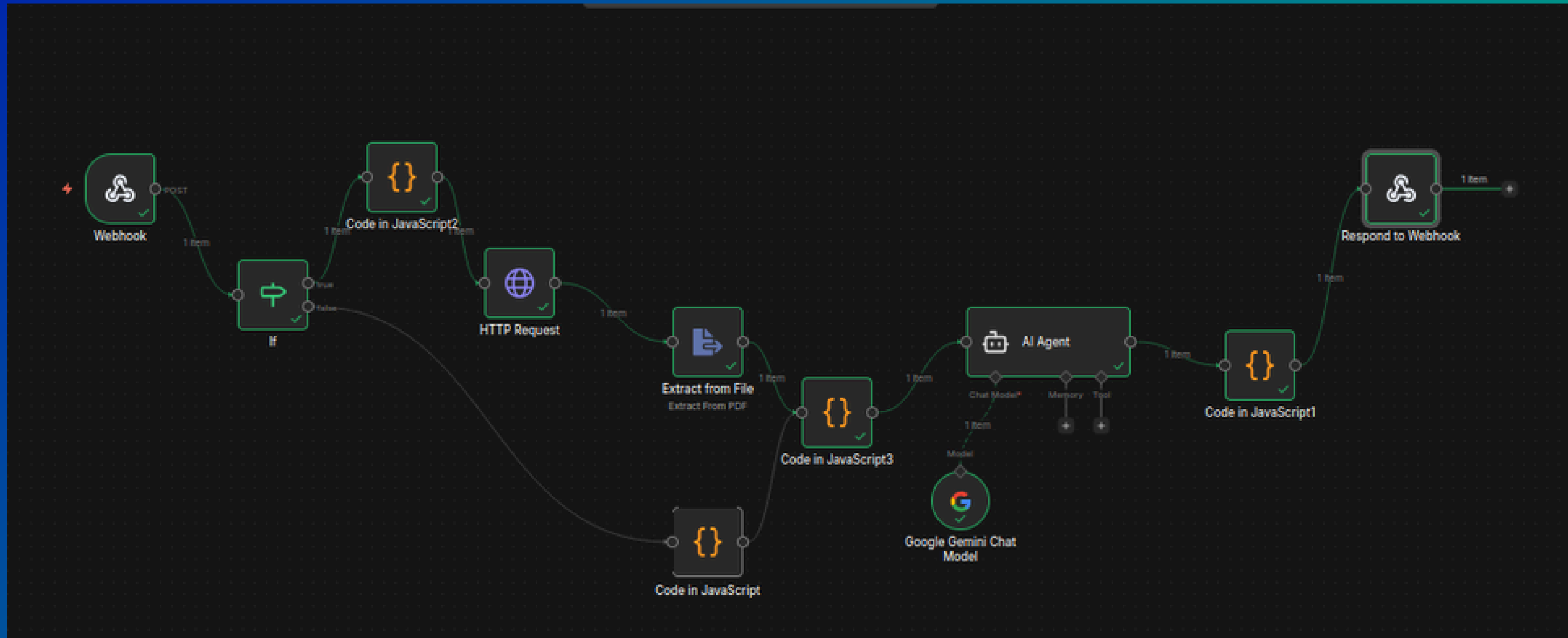
APPENDIX

N8N workflow for role generation: (web scrapping from tanit and bayt for tunisian market)



APPENDIX

N8N workflow:



APPENDIX

Class Diagram

