# AwareIA Opponent Scouting & AI Data Usage - Technical Implementation Guide

## 1️⃣ Overview

This document provides the technical implementation guide for AwareIA’s AI-powered opponent scouting system. It covers structured data ingestion, unstructured scouting data processing, AI model integration, league rule automation, and backend/frontend development best practices.

## 2️⃣ AI Data Processing & Opponent Feedback Integration

AwareIA’s AI engine processes two types of data:

✅ \*\*Structured Data:\*\* Match results, standings, goals for/against, league tables.

✅ \*\*Unstructured Data:\*\* Coach scouting reports, voice-to-text input, AI-driven opponent feedback.

### A. Structured Data Ingestion (Match Data)

1️⃣ \*\*Data Sources:\*\*

- Fetch match results from EDP & WYSL league websites using API access or web scraping.

- Store match history in a relational database (PostgreSQL or MongoDB).

- Normalize standings, W/L records, and goal differentials for AI use.

2️⃣ \*\*Automated Data Pipeline:\*\*

- Implement \*\*CRON jobs\*\* to fetch match updates daily.

- Use \*\*BeautifulSoup/Selenium\*\* for web scraping where APIs are unavailable.

- AI-enhanced scoring engine computes team strengths based on past performance.

### B. Unstructured Data Processing (Coach Reports & AI Summarization)

1️⃣ \*\*Coach Scouting Input:\*\*

- Coaches submit scouting reports via text or voice-to-text.

- AI applies NLP (GPT-4 API) to extract tactical insights.

- AI clusters themes (e.g., defensive weaknesses, tactical trends).

2️⃣ \*\*AI Processing & Summarization:\*\*

- AI generates summarized reports without exposing direct coach feedback.

- Implement a \*\*transformer-based AI model\*\* for structured text extraction.

- AI detects trends over time (e.g., ‘Opponent struggles with high press’).

## 3️⃣ League Rules Automation & Enforcement

To provide AI-powered rule enforcement and compliance, AwareIA will auto-fetch league rules and use them for tactical insights.

### A. Fetching League Rules Automatically

1️⃣ \*\*Data Sources:\*\*

- Identify structured rule sources from EDP, WYSL, and other league sites.

- Extract PDF rulebooks and process text using OCR where needed.

2️⃣ \*\*Web Scraping Pipeline:\*\*

- \*\*Python Requests / BeautifulSoup / Scrapy\*\* to fetch rule pages.

- Store extracted data in a structured format (JSON or SQL).

### B. AI Interpretation of League Rules

1️⃣ \*\*Rule Categorization:\*\*

- AI classifies rules (substitutions, tie-breakers, player eligibility).

- Rule data is stored in a \*\*vectorized format for retrieval\*\*.

2️⃣ \*\*AI-Generated Compliance Checks:\*\*

- Before a match, AI checks lineup compliance (max subs, player eligibility).

- AI adjusts tactical recommendations based on league-specific constraints.

## 4️⃣ AI-Driven Opponent Scouting Reports

AwareIA generates \*\*opponent scouting insights\*\* before each match based on historical data and crowdsourced reports.

### A. Pre-Match AI Reports

✅ AI analyzes \*\*past match trends, opponent weaknesses, and tactical patterns.\*\*

✅ AI-generated reports \*\*combine structured data (match stats) with unstructured scouting data.\*\*

### B. Post-Match Opponent Feedback Unlock (24-48 Hours Delay)

✅ AI \*\*delays unlocking direct opponent feedback until 24-48 hours post-match\*\*.

✅ AI summarizes trends instead of exposing raw coach comments.

✅ Coaches receive a \*\*notification when opponent insights unlock.\*\*

## 5️⃣ System Architecture & Tech Stack

🔹 \*\*Frontend:\*\* React.js, TailwindCSS, or Vue.js

🔹 \*\*Backend:\*\* Node.js (Express) or FastAPI (Python)

🔹 \*\*Database:\*\* PostgreSQL (structured data) + MongoDB (unstructured reports)

🔹 \*\*AI & NLP:\*\* GPT-4 API for text processing, Whisper AI for voice-to-text.

🔹 \*\*Data Collection:\*\* Scrapy (Python) for web scraping, BeautifulSoup for text parsing.

🔹 \*\*Infrastructure:\*\* AWS Lambda for serverless processing, Firebase for push notifications.

## 6️⃣ Development Roadmap & Next Steps

✅ Build \*\*User Registration & Team Association Module\*\*

✅ Develop \*\*Opponent Scouting Input & AI Summarization System\*\*

✅ Integrate \*\*League Match Data Pipeline (EDP & WYSL API/ scraping)\*\*

✅ Implement \*\*League Rules Ingestion & Compliance Checker\*\*

✅ Launch \*\*Beta Testing with Select Coaches & Clubs\*\*