PROJECT PLANNING PHASE

SOLUTION ARCHITECTURE

Date	02 NOV 2025
TeamID	NM2025TMID06943
Project Name	Streamlining Ticket Assignment for efficient support operations
Maximum mark	4 marks

The **Solution Architecture** for streamlining ticket assignment defines the integrated components and data flow within the proposed **Hybrid Intelligent Routing System**. At its foundation, the architecture ensures seamless coordination between automation, machine learning, and human oversight to achieve accurate, efficient, and adaptive ticket routing.

1.Inbound Ticket Ingestion Layer

All incoming tickets—whether submitted via **email, chat, web forms, or APIs**—are first received and **normalized** to a standard data format. This layer ensures data consistency and prepares the tickets for downstream processing.

2.Pre-Processing & ML Tagging Module

Once normalized, tickets flow into this module, where **Natural Language Processing (NLP)** algorithms extract key contextual details such as **product type, issue category, and urgency indicators**.
A **trained Machine Learning (ML) model** then classifies the ticket, assigning preliminary **skill tags**, a **category prediction**, and a **severity score** based on historical data and learned patterns.

4. Intelligent Routing Engine

Acting as the system's **decision-making core**, the Intelligent Routing Engine integrates two essential data sources:
Agent Profile & Skill Matrix Database – Stores each agent's technical expertise, certifications, language proficiency, and availability.
Real-Time Load Balancer – Continuously monitors current agent queues, open tickets, and workload capacity.
Using this combined data, the engine applies defined **routing logic and AI-driven predictions** to determine the most suitable agent or group for assignment.

4.Assignment Execution & Triage Handling

Based on the routing decision, tickets are automatically **dispatched to the appropriate agent queue** within the ServiceNow environment.
If the model's confidence score falls below a defined threshold, the ticket is redirected to a **Human Triage Queue**, where experienced agents manually validate and correct the assignment. This ensures reliability while maintaining automation efficiency.

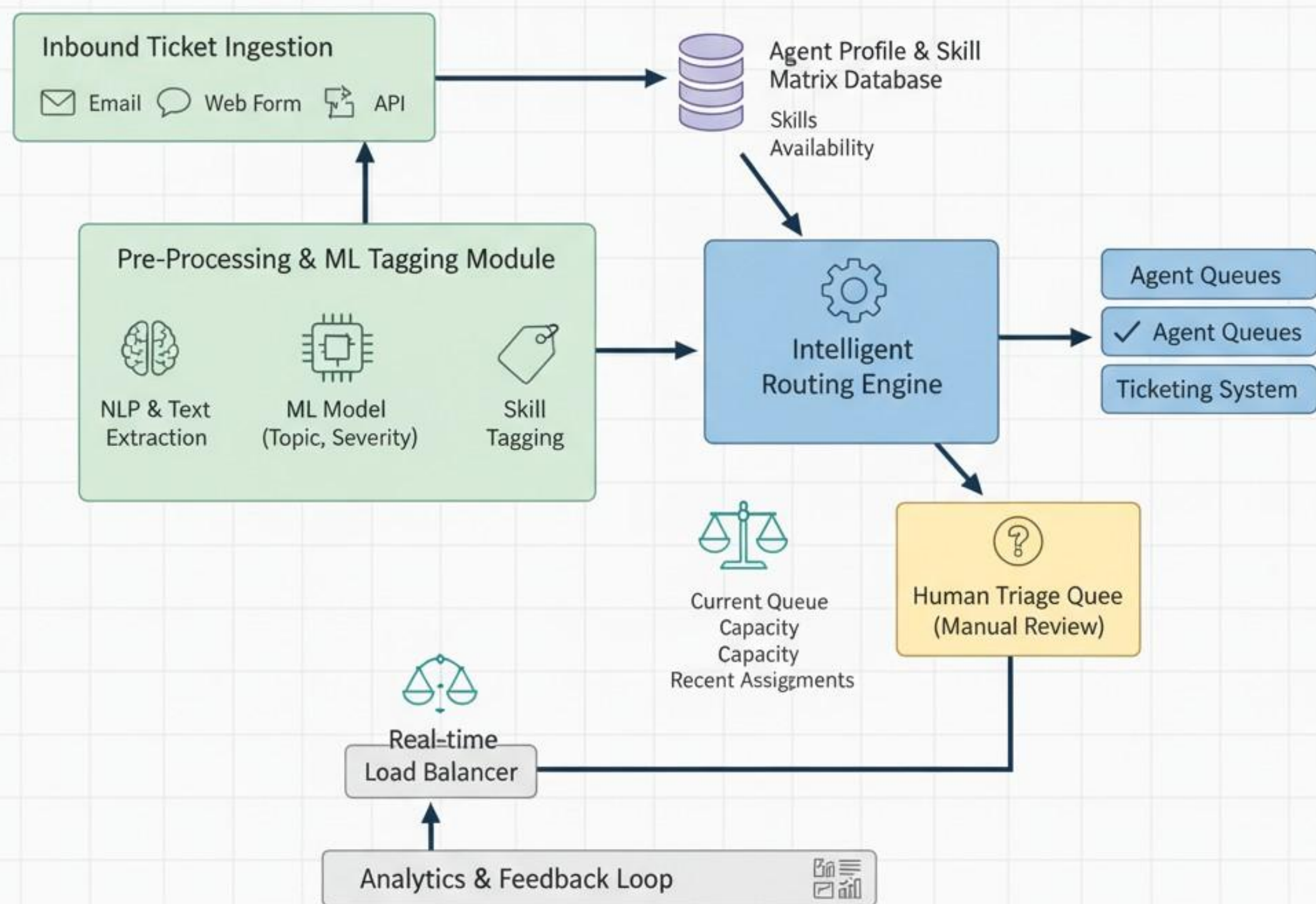### 5.Analytics & Continuous Feedback Loop

A dedicated **Analytics and Performance Monitoring Layer** tracks key operational metrics such as **assignment accuracy**, **re-assignment rates**, and **agent workload distribution**.
These insights form a **data feedback loop** that continuously retrains the ML model and optimizes routing rules, ensuring the system becomes progressively smarter and more adaptive over time.

Outcome

This end-to-end architecture enables **data-driven, context-aware, and continuously improving ticket assignment**. By unifying ML intelligence, workload management, and human oversight, the system delivers higher accuracy, faster response times, and improved customer satisfaction.

Solution Architecture Overview

The architecture is designed as a sequence of interconnected processing layers that act upon the incoming **Task** record (like an Incident).

Architectural Components and Data Flow Layers

This architecture moves data through distinct, sequential layers to achieve intelligent and efficient assignment.

1. Ingestion&Data Layer (The Source)

- **Components: Incident/Service Catalog/Task Table, Service Portal, Email/Virtual Agent Inbound Channels**.
- **Function:** Captures the initial ticket data. This layer provides the raw input for all subsequent automated processes. **CSDM** data (like the linked **CI** or **Service**) ensures the context is rich from the start.

2. Classification&Prediction Layer (The Brain)

- **Components: Predictive Intelligence (PI) Classification Solution**.
- **Function:** This is where machine learning is applied.
    - The PI model analyzes the ticket's **text fields** (Short Description, Description).
    - It outputs a predicted **Assignment Group** with a confidence score. A high score bypasses manual triage; a low score routes the ticket to a manual review step.

3. Decision&Routing Layer (The Rules Engine)

- **Components: Flow Designer, Business Rules, Assignment Rules**.
- **Function:** This layer processes the classified data and enforces organizational policies.
    - **Flow Designer** orchestrates the overall sequence: *If PI confidence is high, skip to AWA; otherwise, run manual checks*.
    - **Business Rules** execute server-side logic for immediate assignments based on hard criteria (e.g., "If Priority is P1, assign directly to 'Major Incident Response Group'").
    - This layer determines the final, authoritative **Assignment Group**.

4. Capacity&Final Assignment Layer (The Dispatcher)

- \ **Components: Advanced Work Assignment (AWA)**, Agent Capacity Rules, Skill Mapping Table.
- \ **Function:** This is the critical step that moves the ticket from being assigned to a **Group** to being assigned to an **Individual Agent (Assigned To)**.
  - o AWA queries the **Agent's current status** (busy/available) and **Capacity limits**.
  - o It checks the agent's **Skills** against the ticket's required skills.
  - o It applies the chosen load-balancing algorithm (**Round Robin**, **Least Busy**) to select the best-fit agent.

5. Output&Feedback Layer (The Result)

- \ **Components: Notifications Framework**, **Activity Stream**, **Performance Analytics (PA)**.
- \ **Function:**
  - o The ticket is assigned, and relevant parties are notified.
  - o The entire assignment process (who assigned it, when, and why) is captured in the **Audit Logs** and **Activity Stream** for transparency.
  - o The final assignment data (Group, Agent, Time to Assign) feeds into **PA Indicators**, closing the loop and providing data to refine the PI model (**Layer 2**).