International Applicant Rating Algorithm

Project Requirements and Specifications

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1. Introduction

The International Applicant Rating Algorithm (IARA) is a system designed for Washington State University (WSU) to improve the evaluation of international student applications. Currently, admissions staff must rely heavily on manual review of data from Slate, including GPA, travel history, curriculum, applicant essays, and other risk factors. This process is time-consuming, prone to inconsistencies, and often delays decision-making, making it difficult to apply the admissions rubric fairly and efficiently across large applicant pools.

The objective of IARA is to automate and standardize the applicant scoring process while ensuring fairness and transparency. The system will calculate categorical scores and combine them into a composite rating that admissions counselors can use to compare applicants. Essays will be analyzed using AI, with fallback methods available if AI services cannot be accessed. Results will include a detailed breakdown and exportable reports to ensure decisions can be explained and defended.

Future versions will expand integration with Slate, improve AI-assisted document processing, and allow administrators to adjust scoring rules via configuration files rather than direct code changes. By combining automation with human oversight, WSU can improve efficiency, reduce bias, and build a scalable system for international admissions.

2. System Requirements Specification

This section outlines the key functional and non-functional requirements and use cases for the International Applicant Rating Algorithm system. It provides an overview of the system's intended features, behavior, and interactions with admissions counselors and other stakeholders involved in evaluating international applicants.

2.1. Use Cases

Use Case 1: Input Student Profile Data

Actor	Admissions Counselor
Precondition	Counselor is logged-in/authenticated and the form is open and empty

Postcondition	Student's academic, financial, and behavioral attributes are entered into the system (not yet analyzed)
Main Flow	1. Counselor opens application 2. Counselor enters Student ID, GPA, country of origin, curriculum type, travel history, essays, and risk factors.
Alternative Flow	− Missing or invalid fields >> form is incomplete
Related Requirements	FR – 01

Use Case 2: Analyze Student

Actor	Admissions Counselor
Precondition	Use case 1 is completed, required fields filled, application is open
Postcondition	System displays positive, negative, and composite scores with AI insights.
Main Flow	1. Counselor selects *Analyze Student*. 2. System validates input fields. 3. The system calculates positive scores (e.g., GPA, curriculum, essay quality) and negative scores (e.g., payment issues, missing docs). 4. System computes composite score and shows factor breakdown.
Alternative Flow	− Missing/invalid fields → highlights errors. − AI timeout → fallback used. − Invalid config → process aborted.
Related Requirements	FR – 03 FR – 04 FR – 05 FR – 06 FR – 07 FR – 08 FR – 10 NFR – 02 NFR – 10

Use Case 3: Show Essay Statistics

Actor	Admissions Counselor
Precondition	Essay text is present in the Personal Essay section
Postcondition	A panel displays stats on the essay (stat types like chars, words, reading time, etc.)
Main Flow	1. Counselor clicks Stats button 2. System computes and displays the text statistics

Alternative Flow	− Essay is empty/whitespace >> no stats are shown
Related Requirements	FR – 02 FR – 10

Use Case 4:

| Actor	Admissions Counselor
Precondition	Essay text is present in Personal Essay section
Postcondition	Counselor views a formatted, read only document of the essay with no scoring performed.
Main Flow	1. Counselor clicks Preview 2. System displays a formatted preview of the essay for easier reading.
Alternative Flow	− Essay is empty >> counselor needs to enter text
Related Requirements	FR – 02

Use Case 5:

Actor	Admissions Counselor
Precondition	Essay section contains entered text
Postcondition	Essay field is reset to empty without changing other fields
Main Flow	1. Counselor enters or pastes text into the essay field 2. Counselor clicks the Clear button 3. System clears the essay text box
Alternative Flow	If essay field is empty >> Clear does nothing
Related Requirements	FR – 01 FR – 02

Use Case 6:

Actor	Admissions Counselor
Precondition	Counselor has form open with risk factor checkboxes visible
Postcondition	Risk factors that are selected are stored and applied during student analysis, which contribute to deductions and will be explained in factor breakdown
Main Flow	1. Counselor selects risk factor checkboxes 2. When analyze student is clicked, or Use Case 2 is ran, the system applies the risk factors to the negative deductions/financial risks

Alternative Flow	No risk factors selected >> system runs at default and marks as low risk
Related Requirements	FR – 04 FR – 06 FR – 07

International Applicant Rating Algorithm
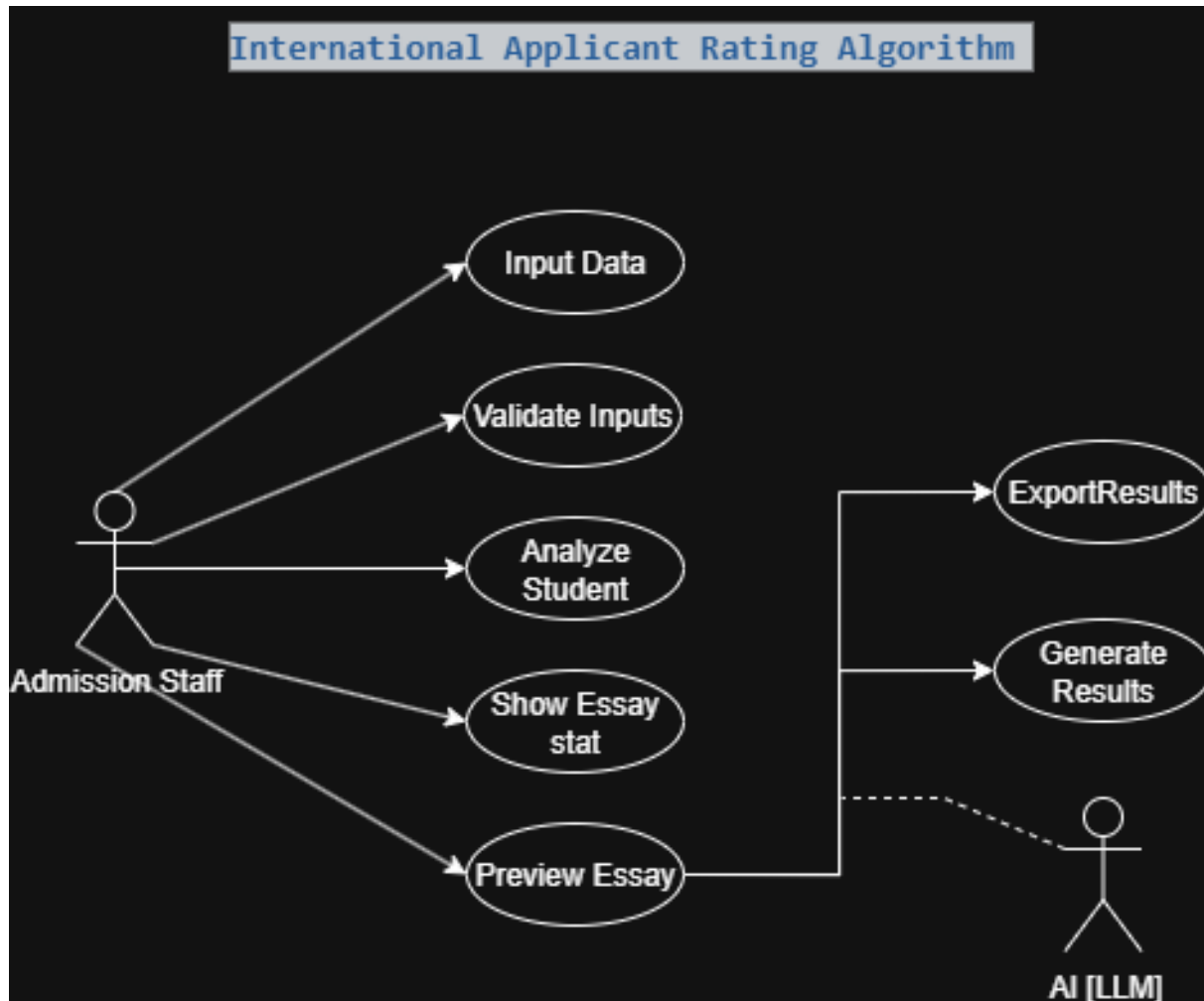
2.2. Functional Requirements

2.2.1. Student Data Input

FR – 01: Input Student Data

Description	The system shall enable authorized users to input comprehensive student information, including Student ID, GPA, country of origin, curriculum type, travel history, personal essay, and associated risk factors
Source	Client rubric, Team brainstorm
Priority	Level 0

FR – 9: Field Validation

Description	The system shall validate required fields and provide real-time feedback if any inputs are missing.
Source	Client rubric, Team brainstorming
Priority	Level 0

2.2.2. Essay Analysis

FR – 02: Essay Analysis with Fallback

Description	The system shall perform AI-driven essay analysis to assess sentiment, motivation, and academic focus, with a fallback to local heuristic analysis in the event of API failure.
Source	Client rubric, GenAI brainstorming
Priority	Level 0

FR – 08: AI Insights

Description	The system shall show AI insights and recommendations based on final scoring.
Source	Client rubric, AI brainstorming
Priority	Level 1

FR – 09: AI Fallback Support

Description	The system shall support both AI-powered analysis and local fallback analysis when APIs are unavailable.
Source	Client rubric, Team brainstorming, GenAI brainstorming
Priority	Level 0

2.2.3. Scoring Engine

FR – 03: Positive Score Calculation

Description	The system shall calculate positive scores based on GPA, curriculum rigor, travel experience, essay quality, and motivational indicators derived from AI analysis.
Source	Client rubric
Priority	Level 0

FR – 04: Negative Score Calculation

Description	The system shall calculate negative deductions based on fee waiver requests,

	payment issues, pending documents, and early I-20 requests.
Source	Client rubric
Priority	Level 0

FR – 05: Composite Score Calculation (POS/NEG/AI)

Description	The system shall compute a final composite score combining positive scores, negative deductions, and AI analysis.
Source	Client rubric
Priority	Level 0

FR – 06: Financial Risk Assessment

| Description	The system shall assess financial risk levels using application fee waivers, payment issues, and regional risk factors
Source	Client rubric
Priority	Level 0

2.2.4.   Results

FR – 07: Results Presentation

Description	The system shall present results in a structured format, including Academic, Financial, and Behavioral scores, overall enrollment probability, and detailed factor breakdown
Source	Client rubric
Priority	Level 0
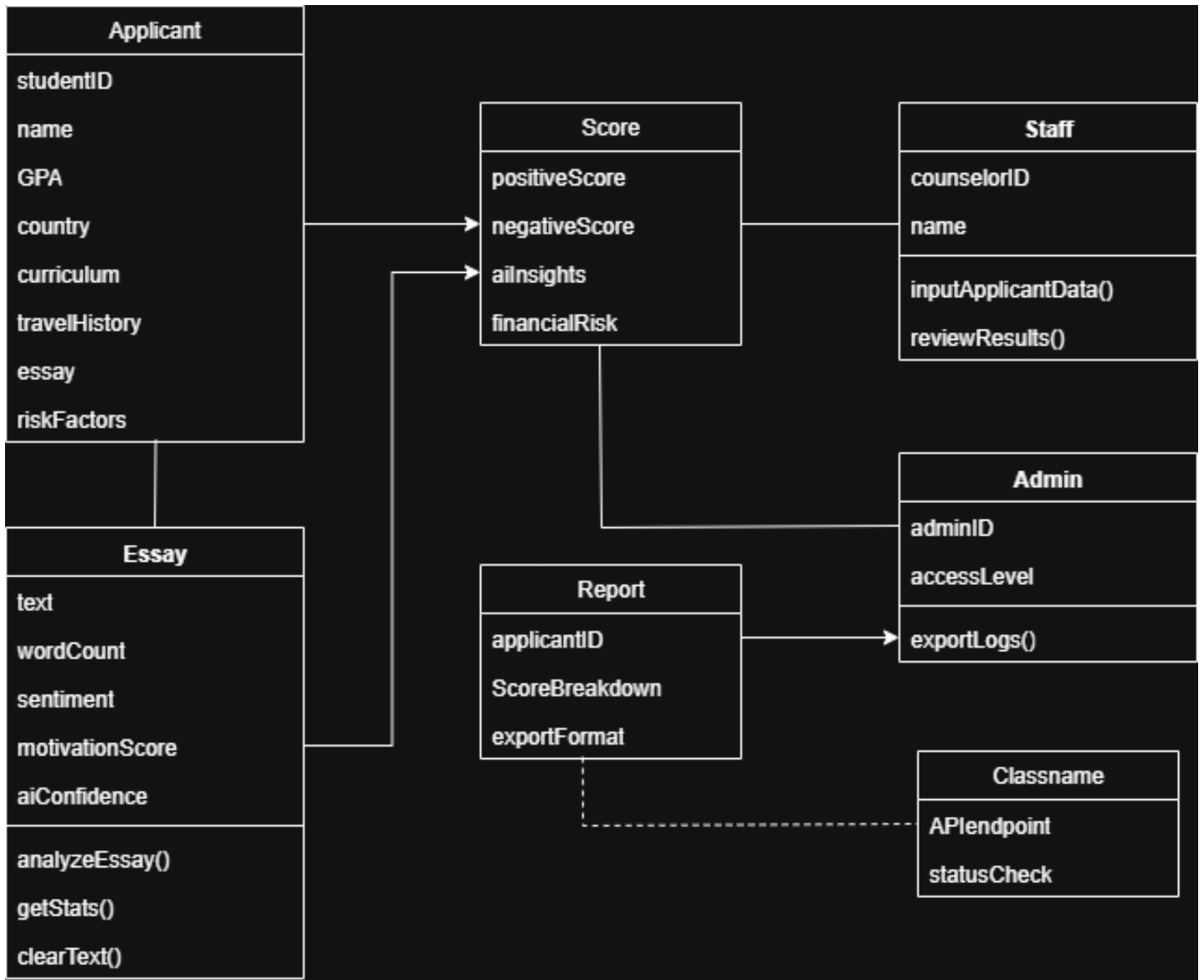
2.3. Non-Functional Requirements

NFR-01: Scalability (Concurrent Users)
The system shall support up to 500 concurrent users without performance degradation.

NFR-02: Data Accuracy
The system shall match student data against the client-provided spreadsheet with 100% accuracy; any discrepancies shall be flagged.

NFR-03: Security and Role-Based Access
Data shall be protected with WSU-issued keys and role-based authorization (student, counselor, admin, etc.).

NFR-04: Compliance and Auditability
The system must comply with relevant data regulations, restrict unauthorized access, maintain a trail of who viewed which records, and allow data to be sent or deleted when authorized.

NFR-05: Availability
The system shall achieve at least 99% uptime per month, with only planned or scheduled maintenance, which must include at least 24+ hours of advance warning.

NFR-06: Performance (Batching & Parallel Processing)
The system shall handle applicant volumes larger than expected by batching requests and supporting parallel processing for scoring.

NFR-07: Configurable Export Formats
Scoring results shall be exportable in multiple file formats (e.g., JSON, YAML). New configurations shall not require redeployment.

NFR-08: Logging and Monitoring
The system shall track key metrics (uploads, scoring time, error rates, AI response speed) and maintain logs including config version, user info, and timestamps. An admin shall be able to receive daily summaries and export this data.

NFR-09: Accessibility
The system shall be accessible to users with disabilities, ensuring core actions are possible within a few clicks of the homepage and that errors are displayed clearly and immediately.

NFR-10: AI Fallback Handling
If AI services are unavailable or exceed timeout thresholds, the system shall perform a fallback process and mark the result as an AI fallback error.

3. System Evolution

There are several key assumptions that the International Applicant Rating Algorithm is built on. First, it assumes that the admissions process for international students will continue to require a structured method for evaluating applicants based on their academic, financial, and behavioral factors. The system is designed around the assumption that admissions counselors will manually enter student data through the applications interface rather than direct database integrations. However, this system does anticipate and prepare for future versions that may need to connect with Washington State University's Slate system. If Slate were to update how their data can be accessed or exported, then the system would need to update accordingly. The system also assumes a stable internet connection for the AI essay analysis. It further assumes that AI services will be available and compatible for future versions of the software. API costs or a change in AI policies could cause the team to need to change how AI is used. The system assumes that the current scoring model will continue to reflect stakeholder priorities. If the weighting criteria changes, such as new behavioral metrics being added, the

algorithms may need to be adjusted. Major revisions can affect consistency of past scoring results. This is designed for long term use on modern browsers and does not need any special hardware or software requirements. Updates may need to be made to maintain performance and accessibility with future improvements such as clearer AI explanations, visual score trends, and connections to external applicant databases to make evaluations faster and easier.

4. Glossary

AI (Artificial Intelligence): enables machines to perform tasks requiring human intelligence, such as analyzing essays or generating recommendations.

API (Application Programming Interface): a set of functions that allows software applications to communicate with external systems or services, such as AI models used for essay analysis.
Attribute: measurable or descriptive characteristics of a student applicant (e.g., GPA, travel history, etc.)

Composite Score: The final score generated by combining positive scores, negative deductions, and AI insight to evaluate an applicant's overall potential.

Essay Analysis: process where the system uses AI to evaluate a student's personal essay based on tone, motivation, relevance, etc.

Factor Breakdown: detailed summary showing how each academic, financial, and behavioral component contributes to an applicant's overall score.

Financial Risk: calculated measure of if an applicant may face financial challenges based on indicators such as payment history.

Risk Factors: applicant conditions (e.g., missing documents) that may negatively affect the final score.

Slate: admission management system used by Washington State University to process and track student applications.

5. References

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