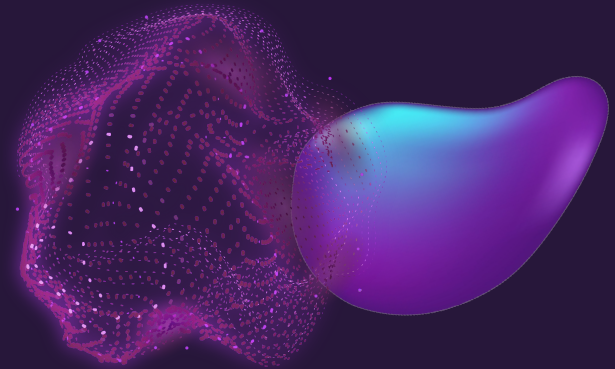
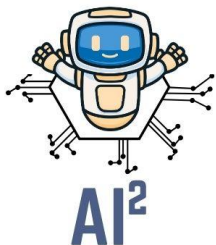




# AI<sup>2</sup>

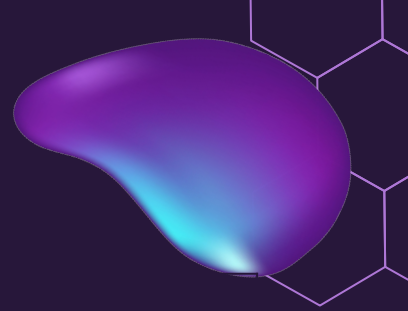
## Artificially Intelligent Invoices



Team Copper  
Fall 2025



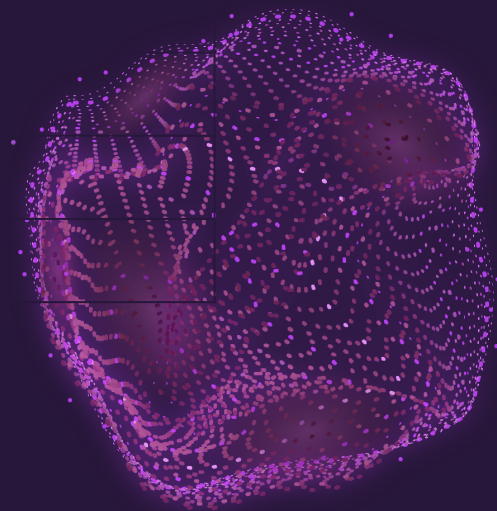
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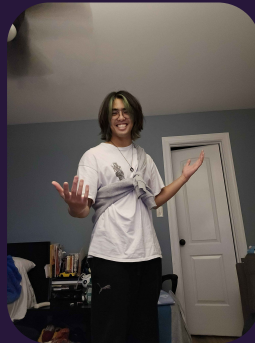
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# Meet The Team



Dusan Djordjevic  
Project Lead



Julian Diaz  
Back-End Developer



Lynda Salinas Ascanova  
Webmaster



Savannah Todd  
Webmaster



Tommy Fuller  
Full Stack Developer



Craig Grubb  
Software Developer  
and Database



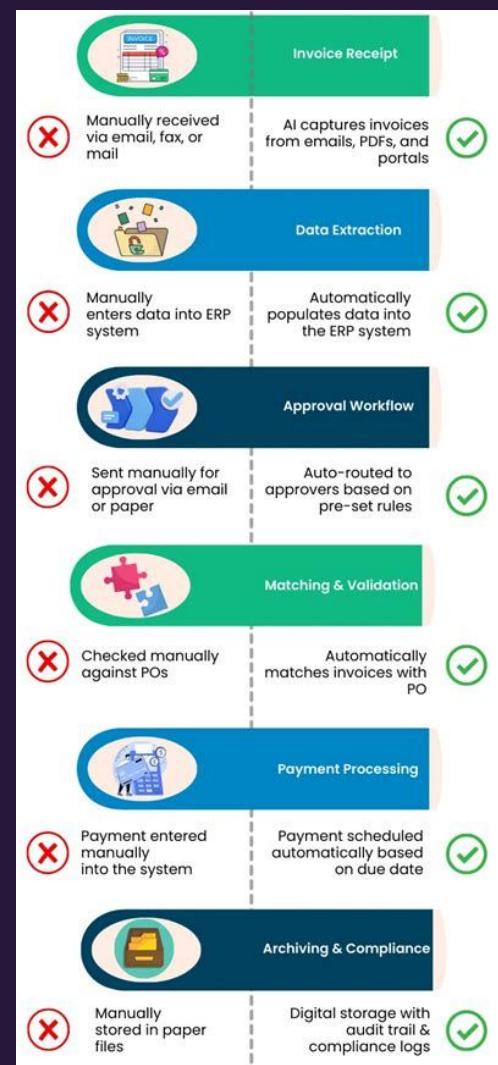
Michael Nimitz  
Software Developer  
and Database



Quin Elson  
Front-End Developer

# Background

- ◆ Manual invoice processing is still widespread across a variety of industries: Approximately 90% of companies rely on manual processing
- ◆ Cost per invoice: \$12-\$40 (manual) as opposed to \$3-\$6 (automated) [3]
- ◆ Turn around time: 10-15 days for manual processing vs. less than 5 days with an automated system
- ◆ Errors are made an estimated 1%-3% of the time when manual processing is used, which can strain business relationships
- ◆ Overall: Manual processing is expensive, slow, and prone to errors



# Background

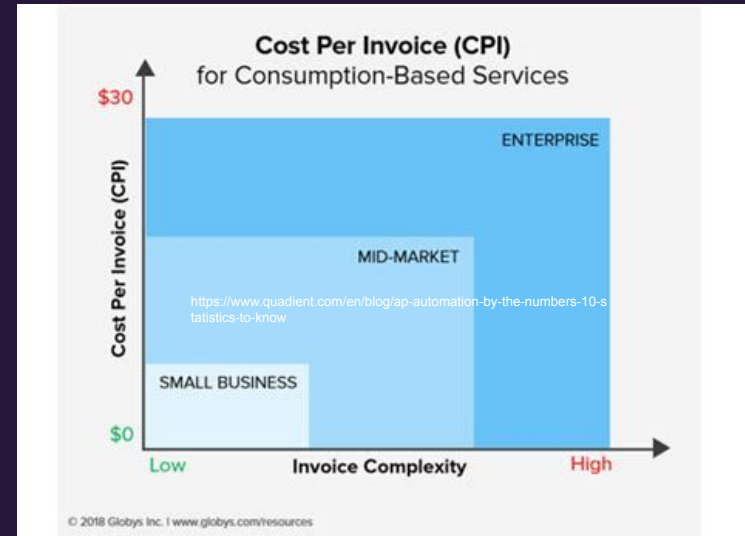
- ◆ 96% of employees report dissatisfaction with the AP tools that they have been provided with [4]. There is clearly a deficiency with the tools currently available.
- ◆ A Gartner study found that 59% of accountants make several financial errors monthly, and cited that many of these mistakes are caused by overextension at work [6].
- ◆ As part of the AP team, accountants and their coworkers would have their workload greatly reduced by automating invoice processing, with studies showing an 80% increase in productivity after adopting AP Automation [7].
- ◆ Automating invoice processing would not only let AP employees shift their focus back onto work utilizing their special skills, and reduce accounting errors, it would greatly boost employee morale as well.



[5]

# Background ADS Case Example

- ◆ ADS processes 150,000 invoices annually from ~3,000 individual suppliers
- ◆ A small team of around 6 staff members handle invoices that are received in a variety of formats PDFs, spreadsheets, etc.
- ◆ Manual handling leads to
  - Delays and payment backlogs
  - Errors (duplicates, mismatches, etc.)
  - Staff overload due to (needless stress over inefficiency)
- ◆ Bottom Line: supplier frustration, compliance risks and potential penalties





# Problem Statement

- **Accounts Payable (AP) manual processing** is costly and inefficient. Between labor costs, printing and mailing expenses, and accounting for errors, each manually processed invoice can cost between \$12 and \$40, which adds up across thousands of invoices. A manually processed invoice takes an average of 14.6 days to process.
- **Every year, ADS receives over 150,000 invoices from about 3,000 suppliers.** These invoices arrive mostly by email and come in many different formats (PDFs, scans, spreadsheets, etc.). The AP team, only 6 people, must manually review each invoice and compare it to the company's Purchase Order. This magnifies the issues of AP manual processing, leading to a high workload, potential for errors, delays, and difficulty with taking in more work.





# Who is Affected

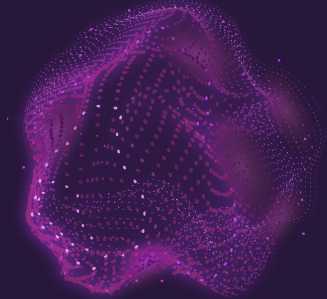


- **Users**
  - ◆ ADS Accounts Payable team, AP manager, and Finance/Accounting leadership are all looking to automate simple, common invoices.
- **Customers**
  - ◆ ADS, the company itself would be willing to provide compensation for a satisfactory product.
- **Stakeholders**
  - ◆ Vendors connected with ADS, ADS Finance, and ADS executives would all experience shorter turnaround times and more effective use of labor with automation of common, simple invoices.

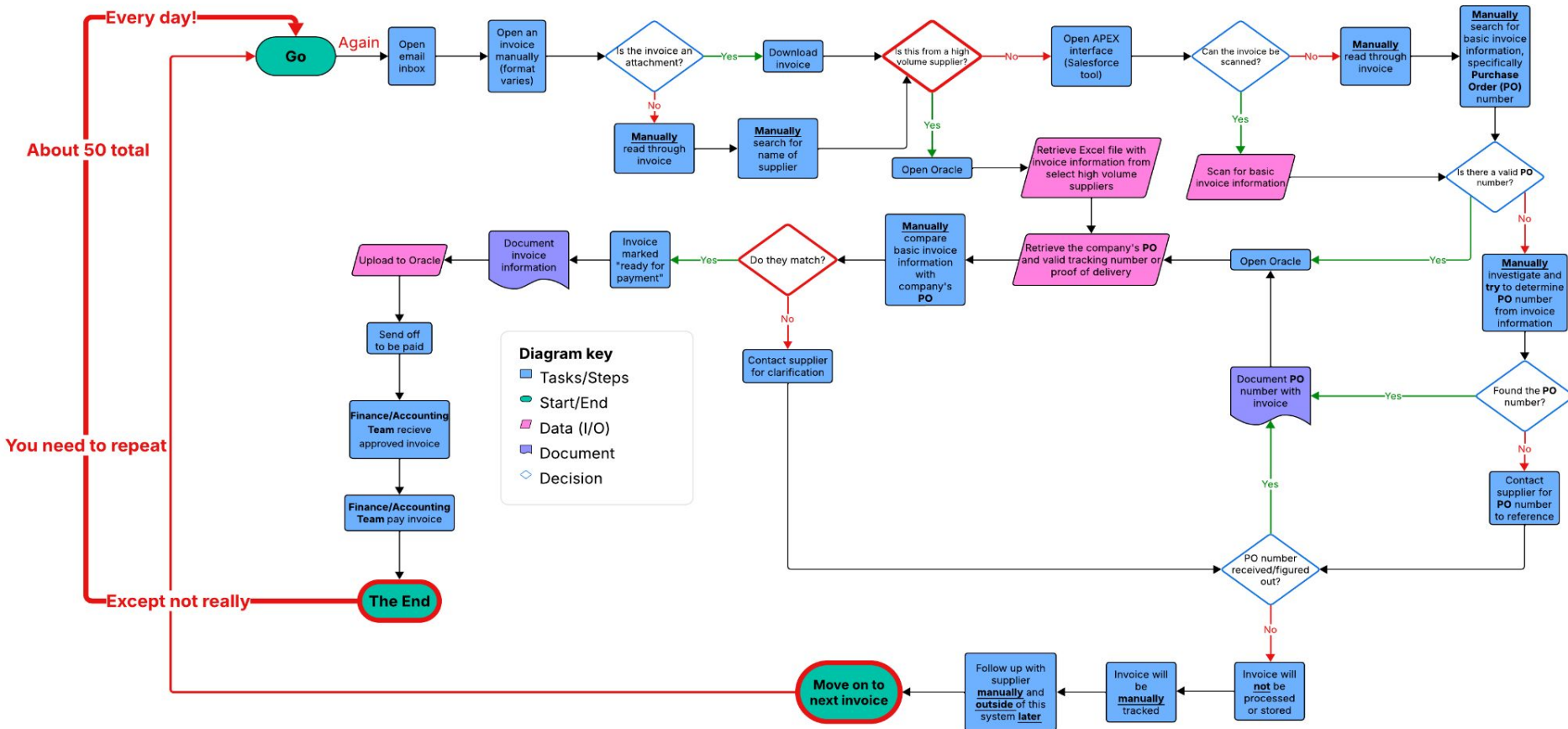


# Problem Characteristics

- ◆ **Excessive Labor Hours:** Labor accounts for 62% of total AP processing costs, mostly consisting of repetitive checking rather than value-added work
- ◆ **High Error Potential:** 39% of invoices contain errors, and  $\frac{1}{3}$  of businesses suffer from making duplicate payments
- ◆ **Delays:** Invoices take an average of 14.6 days to process, payments slowed down due to backlogs, leading to missed discounts and late fees
- ◆ **Scalability:** Already high pressure on the AP team makes it difficult for the company to take on additional clients, limiting financial growth

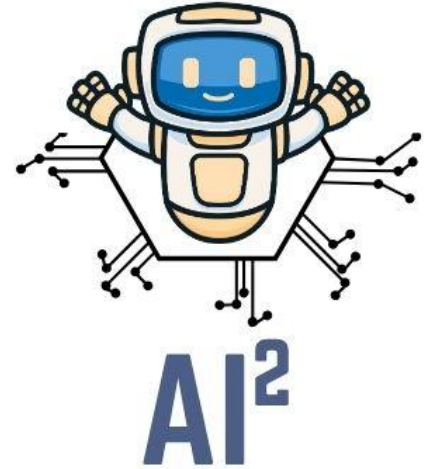


# Current Process Flow



# Our Solution: AI<sup>2</sup>

- ◆ AI<sup>2</sup> is a web-based platform that helps organizations manage high volumes of invoices with greater speed, accuracy, and transparency.
- ◆ Designed to integrate into existing financial workflows, it streamlines repetitive processing, prioritizes exceptions, and continuously adapts to diverse invoice formats across industries.
- ◆ By reducing manual workload while preserving oversight, AI<sup>2</sup> enables faster payments, fewer errors, and stronger financial compliance.



# AI<sup>2</sup> and ADS

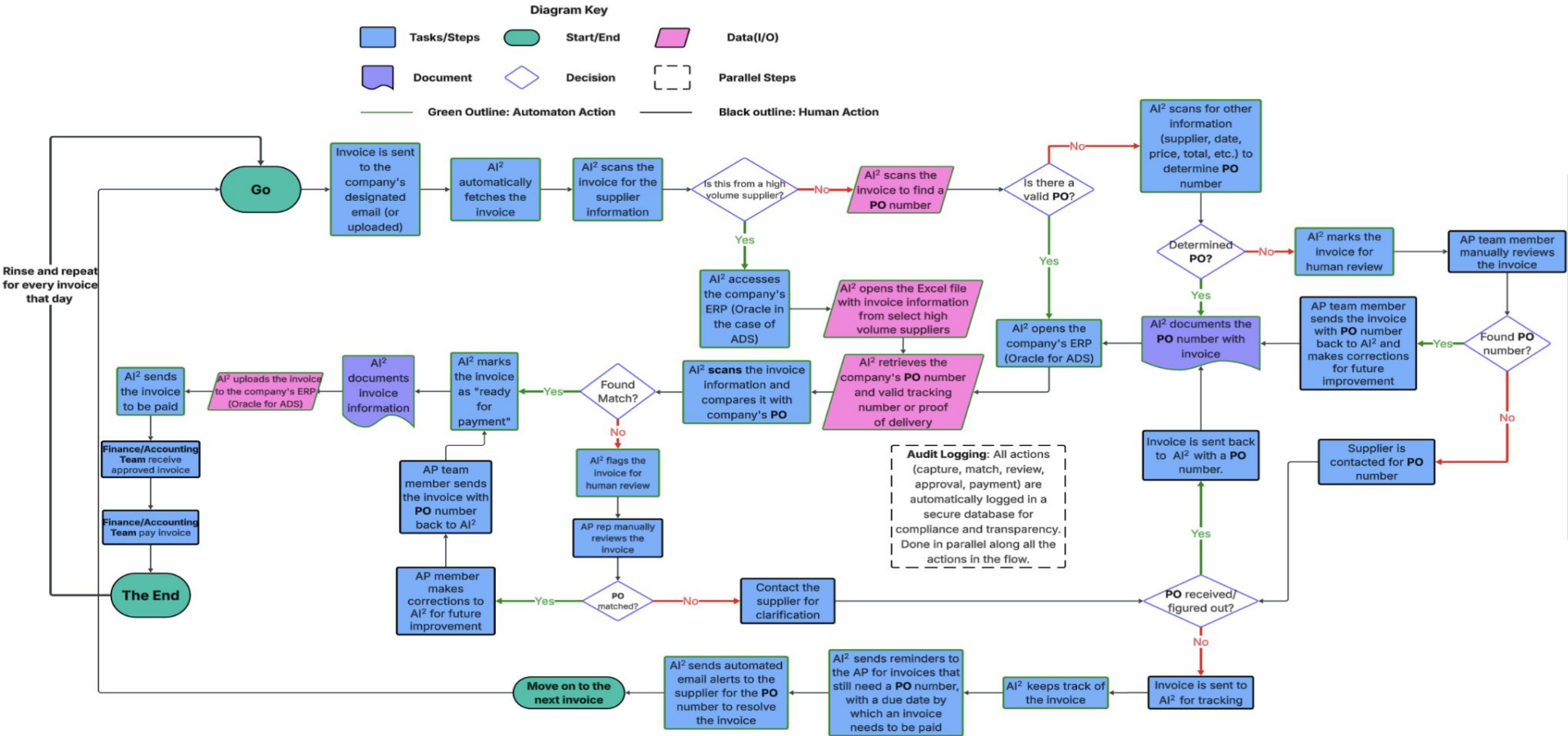
- ◆ For ADS specifically, AI<sup>2</sup> would relieve pressure on a small Accounts Payable team that currently faces over 600 invoices per day. The pressure will continue to grow as the company scales, leading to mistakes like mismatched data or “overreceipts”.
- ◆ By automating intake and matching, while routing edge cases for staff review, the system reduces backlogs and errors without removing human oversight.
- ◆ This allows ADS to accelerate payment cycles, strengthen supplier relationships, and improve overall financial health — outcomes that mirror the benefits other organizations can expect across the industry.



# Solution Characteristics

- ◆ **Efficiency – Automated Invoice Capture and Organization**
  - All invoices are automatically captured from email and structured for review, reducing manual file handling.
- ◆ **Accuracy – Smart and Fast Matching**
  - AI<sup>2</sup> automatically compares invoices to purchasing orders, accelerating processing while minimizing errors and backlogs.
- ◆ **Adaptability – Learning from Corrections**
  - The system improves by learning from staff interventions, reducing redundant work and enabling staff to focus on complex cases.
- ◆ **Transparency – Auto Logging and Compliance**
  - Every invoice and action is tracked in the database, ensuring auditability, compliance, and organizational trust.
- ◆ **Scalability – Beyond just ADS**
  - Designed to adapt to new vendors, formats, and even other companies beyond ADS.

# Solution Process Flow





# What it Will Do

- ◆ **Email Intake and Storage:** Emails will be taken upon arrival and be sorted and prioritized.
- ◆ **Volume Handling:** AI<sup>2</sup> will considerably reduce the manual processing of individual invoices.
- ◆ **AI PO Matching:** Invoices will be matched to their corresponding purchase order.
- ◆ **AI Confidence Scoring:** Scoring system based on certainty of correct purchase order to invoice matches.
- ◆ **Error Matching:** PO matches with lower confidence scores will be prioritized for human intervention.
- ◆ **Continuous Learning from Human Interaction:** System updates matching based on staff corrections.
- ◆ **Supplier Notifications:** AI<sup>2</sup> will send email alerts to suppliers.
- ◆ **AP Team Reminders:** AI<sup>2</sup> will send reminders to the AP team.

# What it Will Do

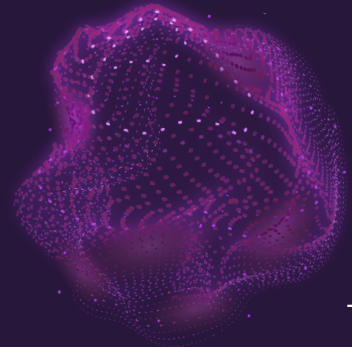
- ◆ **Audit Logging:** Invoices and system decisions are saved in a database for subsequent reviews.
- ◆ **Error Reduction:** Strain on the AP team will be reduced, leading to less mistakes.
- ◆ **Quick Implementation:** Easy for client to plug in and begin using.
- ◆ **Tailored for client:** Specially configured to meet the needs of client.
- ◆ **Long-tail vendor handling:** Streamlines monitoring of invoices from vendors supplying lower-frequency products.
- ◆ **Easily customizable:** Staff will be able to make tweaks to prioritize certain invoices.
- ◆ **Adaptable:** Customizations can be made at any time.
- ◆ **Timeliness:** Automation allows AP team to shift focus to other tasks.



# What it Will Not Do



- ◆ AI<sup>2</sup> will not instill a prioritization system for emails that are not invoice-related. The system will be set up to make priority-related decisions based on the invoice confidence scores, which will not translate to other email content.



# Competition Matrix

|                                           | AI <sup>2</sup> | Tipalti | SAP Concur | QuickBooks | Manual Processing |
|-------------------------------------------|-----------------|---------|------------|------------|-------------------|
| Volume handling                           | ■               | ■       | ■          | ■          | ■                 |
| Error reduction                           | ■               | ■       | ■          | ■          | ■                 |
| Less human interaction                    | ■               | ■       | ■          | ■          | ■                 |
| Timeliness                                | ■               | ■       | ■          | ■          | ■                 |
| AI PO matching                            | ■               | ■       | ■          | ■          | ■                 |
| AI confidence scoring                     | ■               | ■       | ■          | ■          | ■                 |
| Continuous learning from past corrections | ■               | ■       | ■          | ■          | ■                 |
| Quick implementation                      | ■               | ■       | ■          | ■          | ■                 |
| Tailored for client                       | ■               | ■       | ■          | ■          | ■                 |
| Long-tail vendor handling                 | ■               | ■       | ■          | ■          | ■                 |
| Easily customizable                       | ■               | ■       | ■          | ■          | ■                 |
| Adaptable                                 | ■               | ■       | ■          | ■          | ■                 |

# Competition Matrix

|                                           | AI <sup>2</sup> | Tipalti | SAP Concur | QuickBooks | Manual Processing |
|-------------------------------------------|-----------------|---------|------------|------------|-------------------|
| Volume handling                           | ■               | ■       | ■          | ■          | ■                 |
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| AI PO matching                            | ■               | ■       | ■          | ■          | ■                 |
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| Tailored for client                       | ■               | ■       | ■          | ■          | ■                 |
| Long-tail vendor handling                 | ■               | ■       | ■          | ■          | ■                 |
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| Adaptable                                 | ■               | ■       | ■          | ■          | ■                 |

# Competition Matrix

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# Competition Matrix

|                                           | AI <sup>2</sup> | Tipalti | SAP Concur | QuickBooks | Manual Processing |
|-------------------------------------------|-----------------|---------|------------|------------|-------------------|
| Volume handling                           | ■               | ■       | ■          | ■          | ■                 |
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| Adaptable                                 | ■               | ■       | ■          | ■          | ■                 |

# Competition Matrix

|                                           | AI <sup>2</sup> | Tipalti | SAP Concur | QuickBooks | Manual Processing |
|-------------------------------------------|-----------------|---------|------------|------------|-------------------|
| Volume handling                           | ■               | ■       | ■          | ■          | ■                 |
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| Timeliness                                | ■               | ■       | ■          | ■          | ■                 |
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| Adaptable                                 | ■               | ■       | ■          | ■          | ■                 |



# Competition Matrix

|                                           | AI <sup>2</sup> | Tipalti | SAP Concur | QuickBooks | Manual Processing |
|-------------------------------------------|-----------------|---------|------------|------------|-------------------|
| Volume handling                           | ■               | ■       | ■          | ■          | ■                 |
| Error reduction                           | ■               | ■       | ■          | ■          | ■                 |
| Less human interaction                    | ■               | ■       | ■          | ■          | ■                 |
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| Continuous learning from past corrections | ■               | ■       | ■          | ■          | ■                 |
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| Tailored for client                       | ■               | ■       | ■          | ■          | ■                 |
| Long-tail vendor handling                 | ■               | ■       | ■          | ■          | ■                 |
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| Adaptable                                 | ■               | ■       | ■          | ■          | ■                 |

# Competition Matrix

|                                           | AI <sup>2</sup> | Tipalti | SAP Concur | QuickBooks | Manual Processing |
|-------------------------------------------|-----------------|---------|------------|------------|-------------------|
| Volume handling                           | ■               | ■       | ■          | ■          | ■                 |
| Error reduction                           | ■               | ■       | ■          | ■          | ■                 |
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| Continuous learning from past corrections | ■               | ■       | ■          | ■          | ■                 |
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| Tailored for client                       | ■               | ■       | ■          | ■          | ■                 |
| Long-tail vendor handling                 | ■               | ■       | ■          | ■          | ■                 |
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| Adaptable                                 | ■               | ■       | ■          | ■          | ■                 |

# Competition Matrix

|                                           | AI <sup>2</sup> | Tipalti | SAP Concur | QuickBooks | Manual Processing |
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| Volume handling                           | ■               | ■       | ■          | ■          | ■                 |
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| Error reduction                           | ■               | ■       | ■          | ■          | ■                 |
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| Long-tail vendor handling                 | ■               | ■       | ■          | ■          | ■                 |
| Easily customizable                       | ■               | ■       | ■          | ■          | ■                 |
| Adaptable                                 | ■               | ■       | ■          | ■          | ■                 |

# Major Functional Components

## User Interface

- **User Interface**
  - Website application and extension
- **Frequency Query**
  - Filter invoices -> PO based on frequencies, do they match?
- **Data-Field suggestions**
  - Based on pattern-recognition or context

## Application Layer

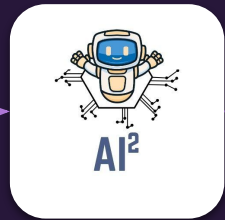
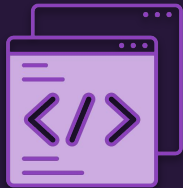
- **Invoice Inbox**
  - Azure (Microsoft Rest Api)
- **AWS Textract (pdf's)**
- **Aperture (spreadsheets)**
- **oracledb driver to access PO's**

## Data Layer

- **Storage Container**
  - Cloud storage (Oracle)
  - Invoice's
  - PO'S
- **Record of previously used invoice formats**
  - And the ability to edit them

# Major Functional Components Diagram

## User Interface

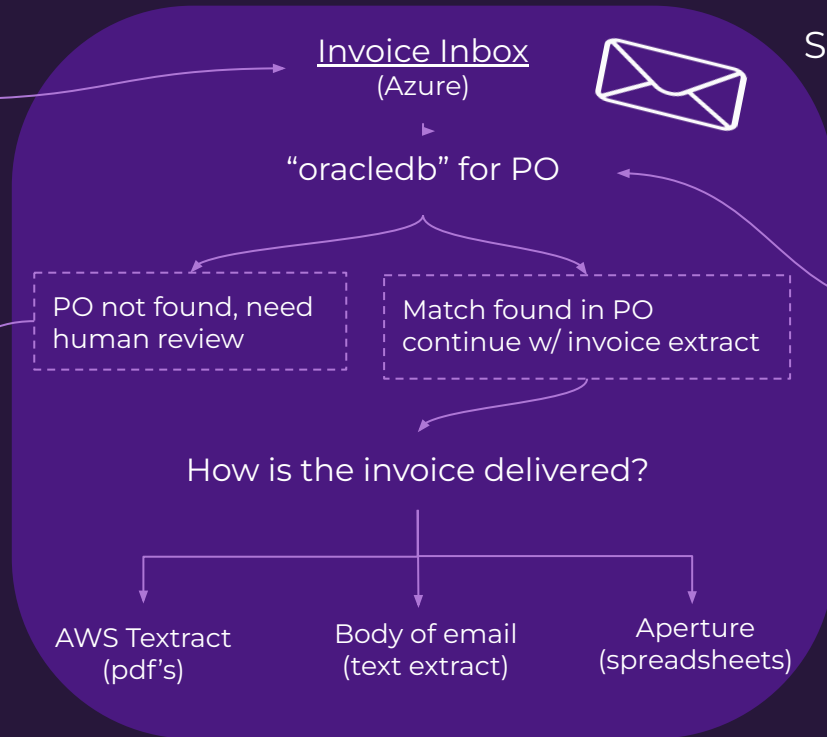


Web Application  
And Extension

Frequency Query

PO Learning Algorithm

## Application Layer



## Data Layer

Storage Container



Pay Order  
Formats



| Invoice Data     |
|------------------|
| Purchase Order # |
| Supplier         |
| Date             |
| Quantity         |

# Development Tools

- ◆ Communication: Discord
- ◆ IDE: VSCode
- ◆ Version Control: Github
- ◆ Website: Github Pages
- ◆ Team Management: Clickup



# User Risks

## Risk

## Impact

- ◆ **R1:** Unassigned Low Confidence Invoices

## Mitigation

- ◆ **M1:** Flagged invoices routed to manual review queue

Likelihood

|           | Very Low | Low | Medium | High | Very High |
|-----------|----------|-----|--------|------|-----------|
| Very High |          |     |        | R1   |           |
| High      |          |     |        |      |           |
| Medium    |          |     |        |      |           |
| Low       |          |     | M1     |      |           |
| Very Low  |          |     |        |      |           |

## Legend

High Risk

Medium Risk

Low Risk

# User Risks

## Risk

## Impact

- ◆ **R2:** Workflow disruption during transition

## Mitigation

- ◆ **M2:** System integrates with existing ADS tools

Likelihood

|           | Very Low | Low | Medium | High | Very High |
|-----------|----------|-----|--------|------|-----------|
| Very High |          |     |        | R1   |           |
| High      |          |     | R2     |      |           |
| Medium    |          | M2  |        |      |           |
| Low       |          |     | M1     |      |           |
| Very Low  |          |     |        |      |           |

## Legend

High Risk

Medium Risk

Low Risk

# User Risks

**Risk**

**Impact**

Very Low      Low      Medium      High      Very High

- ◆ **R3:** Delayed Human Review of Flagged Items

**Mitigation**

- ◆ **M3:** Offering real-time ingestion, auto-flagging, and reminders to the AP team

**Likelihood**

Very High  
High  
Medium  
Low  
Very Low

|           |             |             |             |             |             |
|-----------|-------------|-------------|-------------|-------------|-------------|
| Very High | Medium Risk | Medium Risk | High Risk   | High Risk   | High Risk   |
| High      | Medium Risk | Medium Risk | High Risk   | High Risk   | High Risk   |
| Medium    | Low Risk    | Medium Risk | Medium Risk | Medium Risk | High Risk   |
| Low       | Low Risk    | Low Risk    | Medium Risk | Medium Risk | Medium Risk |
| Very Low  | Low Risk    | Low Risk    | Medium Risk | Medium Risk | Medium Risk |

R1  
R2  
R3  
M2  
M3  
M1

**Legend**

High Risk      Medium Risk      Low Risk

# User Risks

## Risk

## Impact

- ◆ **R4:** Overdependence on automation

## Mitigation

- ◆ **M4:** Confidence scoring will trigger human review automatically

## Likelihood

|           | Very Low | Low | Medium | High | Very High |
|-----------|----------|-----|--------|------|-----------|
| Very High |          |     |        | R1   |           |
| High      |          |     | R2, R4 | R3   |           |
| Medium    |          | M2  | M3     |      |           |
| Low       |          | M4  | M1     |      |           |
| Very Low  |          |     |        |      |           |

## Legend

High Risk

Medium Risk

Low Risk



# User Risks

**Risk**

**Impact**

Very Low

Low

Medium

High

Very High

- ◆ **R5:** Resistance or Misuse of the System

**Mitigation**

- ◆ **M5:** Offering transparent logs to build trust and accountability

**Likelihood**

Very High

High

Medium

Low

Very Low

|           |  |    |        |    |    |
|-----------|--|----|--------|----|----|
|           |  |    |        |    |    |
| Very High |  |    |        | R1 |    |
| High      |  |    | R2, R4 | R3 |    |
| Medium    |  | M2 | M3     |    | R5 |
| Low       |  | M4 | M1, M5 |    |    |
| Very Low  |  |    |        |    |    |

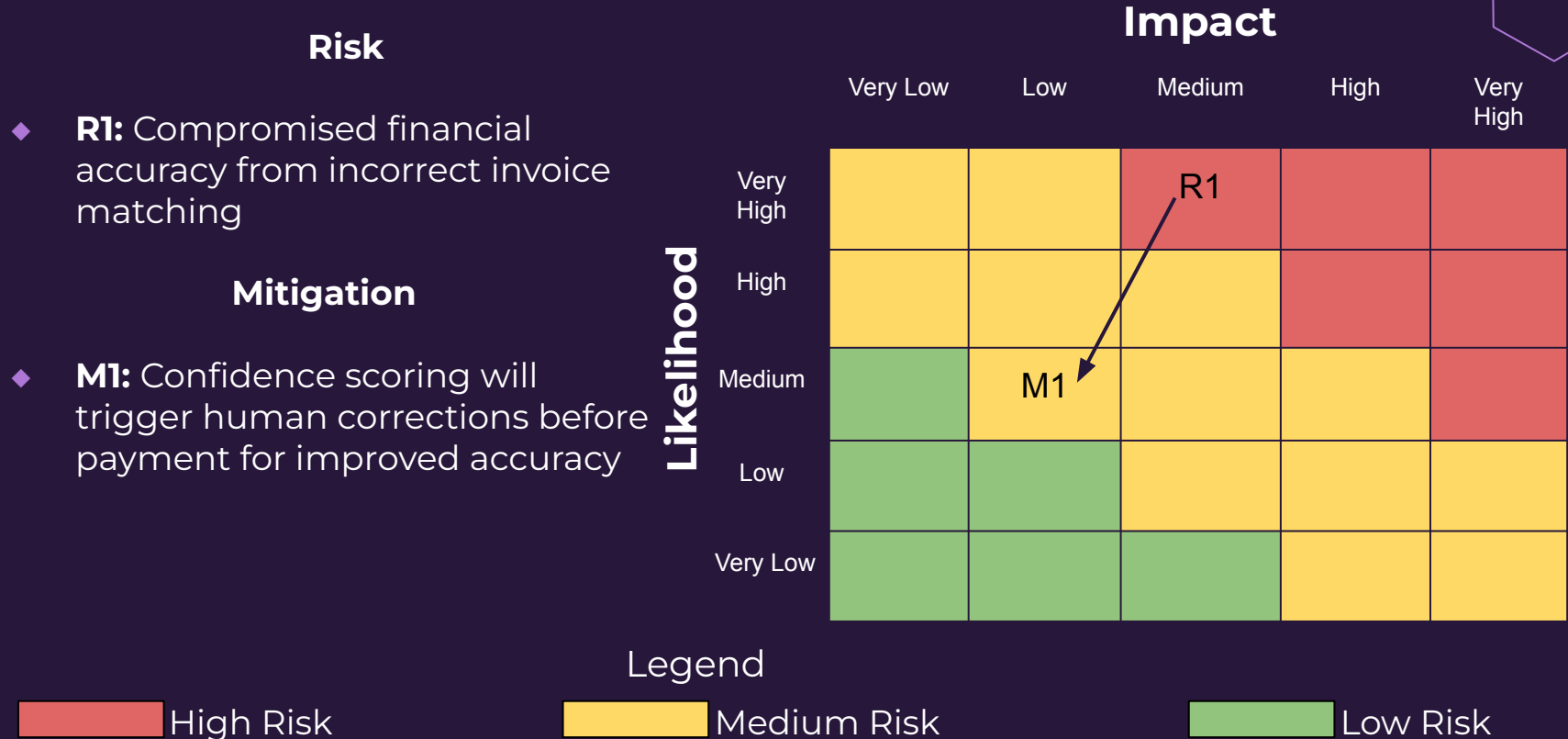
**Legend**

High Risk

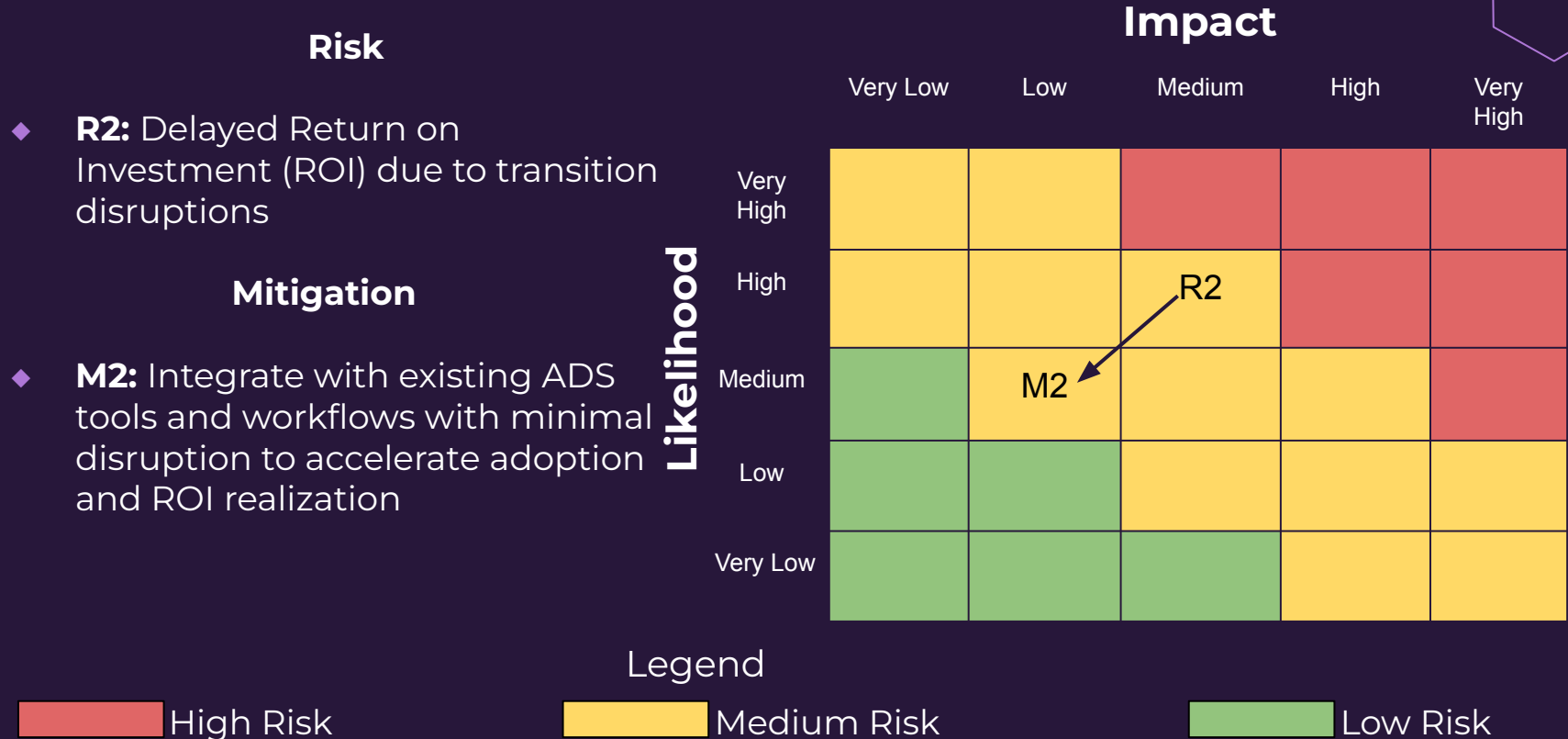
Medium Risk

Low Risk

# Customer Risks



# Customer Risks



# Customer Risks

## Risk

## Impact

- ◆ **R3:** Strain on vendor relationships from missed or late payments

## Mitigation

- ◆ **M3:** Offering automated intake and supplier alerts

## Likelihood

|           | Very Low | Low | Medium | High | Very High |
|-----------|----------|-----|--------|------|-----------|
| Very High |          |     |        |      |           |
| High      |          |     |        |      |           |
| Medium    |          |     |        |      | R3        |
| Low       |          |     | M3     |      |           |
| Very Low  |          |     |        |      |           |

## Legend



High Risk



Medium Risk



Low Risk

# Technical Risks

## Risk

- ◆ **R1:** Optical character recognition (OCR) and parsing errors

## Mitigation

- ◆ **M1:** Multi-engine OCR with validation rules

|            |           | Impact   |     |        |      |           |
|------------|-----------|----------|-----|--------|------|-----------|
|            |           | Very Low | Low | Medium | High | Very High |
| Likelihood | Very High |          |     |        |      |           |
|            | High      |          |     |        | R1   |           |
|            | Medium    |          |     |        |      |           |
|            | Low       |          |     | M1     |      |           |
|            | Very Low  |          |     |        |      |           |

# Technical Risks

**Risk**

- ◆ **R2:** Low accuracy for edge cases

**Mitigation**

- ◆ **M2:** Confidence ratings to include human reviews

|            |           | Impact   |     |        |      |           |
|------------|-----------|----------|-----|--------|------|-----------|
|            |           | Very Low | Low | Medium | High | Very High |
| Likelihood | Very High |          |     |        |      |           |
|            | High      |          | R2  |        | R1   |           |
|            | Medium    |          |     |        |      |           |
|            | Low       | M2       |     | M1     |      |           |
|            | Very Low  |          |     |        |      |           |

# Technical Risks

**Risk**

**Impact**

- ◆ **R3:** Integration failures

**Mitigation**

- ◆ **M3:** Robust APIs that include sandbox testing

|            |           | Very Low | Low | Medium | High | Very High |
|------------|-----------|----------|-----|--------|------|-----------|
| Likelihood | Very High |          |     |        |      |           |
|            | High      |          | R2  |        | R1   |           |
|            | Medium    |          |     | R3     |      |           |
|            | Low       | M2       |     | M1     |      |           |
|            | Very Low  |          | M3  |        |      |           |

# Technical Risks

Risk

Impact

- ◆ **R4:** Scalability

Mitigation

- ◆ **M4:** Microservice architecture

Likelihood

|           | Very Low | Low | Medium | High | Very High |
|-----------|----------|-----|--------|------|-----------|
| Very High |          |     |        |      |           |
| High      |          | R2  |        | R1   |           |
| Medium    |          |     | R3     | R4   |           |
| Low       | M2       |     | M1     |      |           |
| Very Low  | M4       | M3  |        |      |           |



# Technical Risks

- ◆ **Risk**
  - ◆ **R4:** Model drift
- ◆ **Mitigation**
  - ◆ **M4:** Continuous retraining and KPI monitoring

|            |           | Impact   |     |          |      |           |
|------------|-----------|----------|-----|----------|------|-----------|
|            |           | Very Low | Low | Medium   | High | Very High |
| Likelihood | Very High |          |     |          |      |           |
|            | High      |          | R2  |          | R1   |           |
|            | Medium    |          |     | R3<br>R4 |      |           |
|            | Low       | M2       | M4  | M1       |      |           |
|            | Very Low  |          | M3  |          |      |           |

# Technical Risks

Risk

Impact

- ◆ **R5:** AI black box

Mitigation

- ◆ **M5:** Include confidence scores and extracted source fields in logging

| Likelihood | Impact   |     |          |      |           |
|------------|----------|-----|----------|------|-----------|
|            | Very Low | Low | Medium   | High | Very High |
|            |          |     |          |      |           |
|            |          | R2  |          | R1   |           |
|            |          |     | R3<br>R4 |      |           |
|            |          |     |          |      |           |
| Very High  |          |     |          |      |           |
|            |          |     |          |      |           |
| High       |          |     |          |      |           |
|            |          |     |          |      |           |
| Medium     |          |     |          |      |           |
|            |          |     |          |      |           |
| Low        |          |     |          |      |           |
|            |          |     |          |      |           |
| Very Low   |          |     |          |      |           |
|            |          |     |          |      |           |

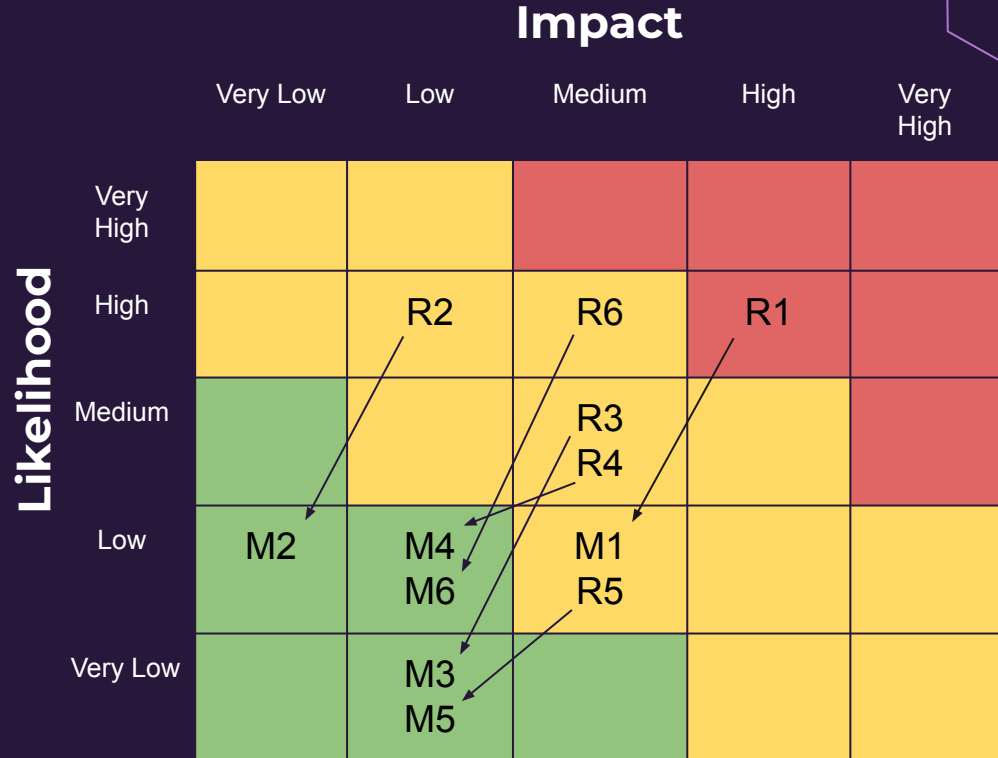
# Technical Risks

**Risk**

- ◆ **R6:** Excessive manual corrections

**Mitigation**

- ◆ **M6:** Progressive machine learning



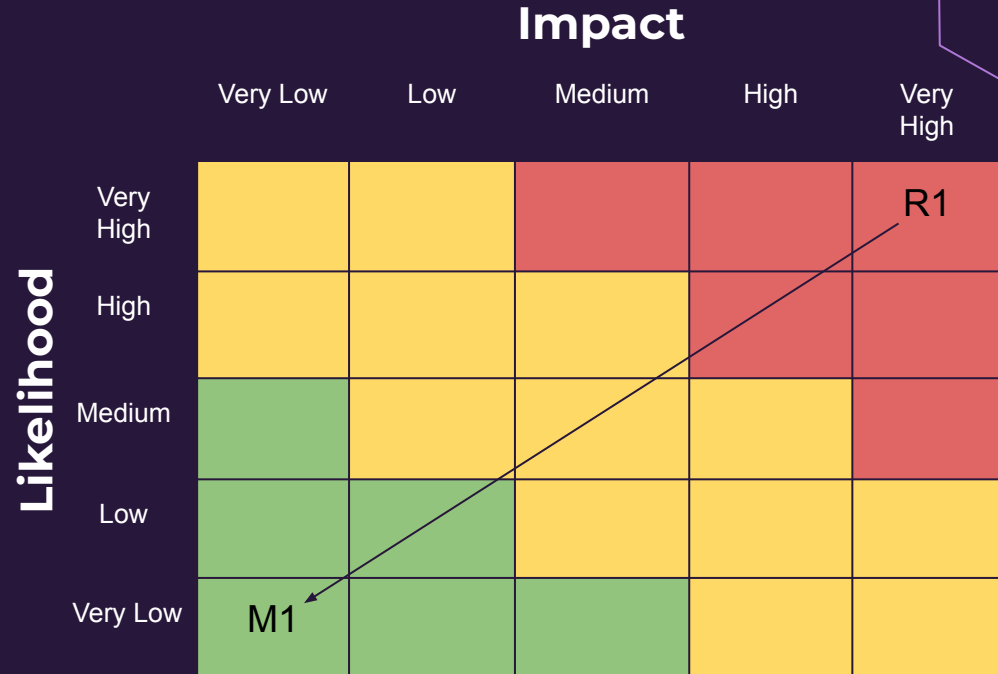
# Security Risks

## Risk

- ◆ **R1:** Data confidentiality

## Mitigation

- ◆ **M1:** End-to-end encryption, multi-factor authentication, and clear role-based security groups



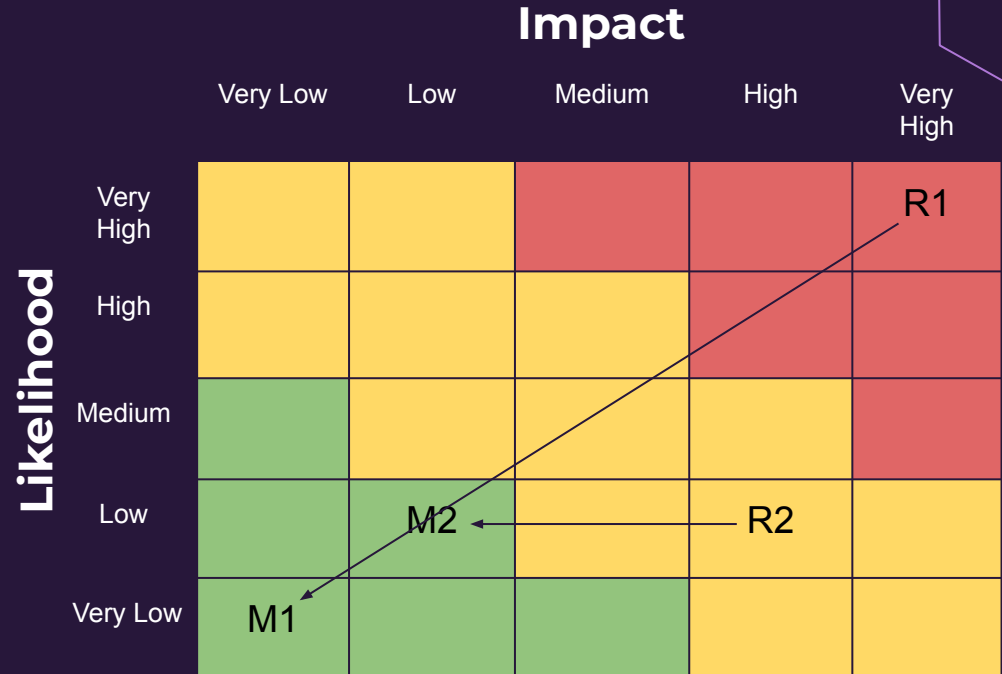
# Security Risks

## Risk

- ◆ **R2:** Data residency

## Mitigation

- ◆ **M2:** Provide region-specific data hosting



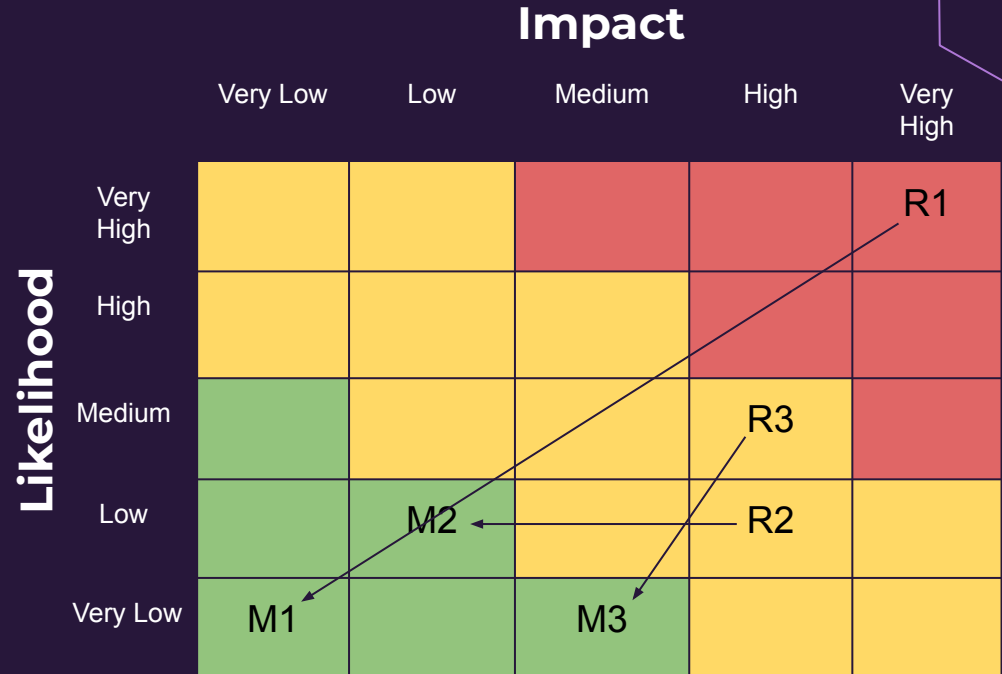
# Security Risks

## Risk

- ◆ **R3:** Supply chain attacks

## Mitigation

- ◆ **M3:** Malware scanning on all libraries



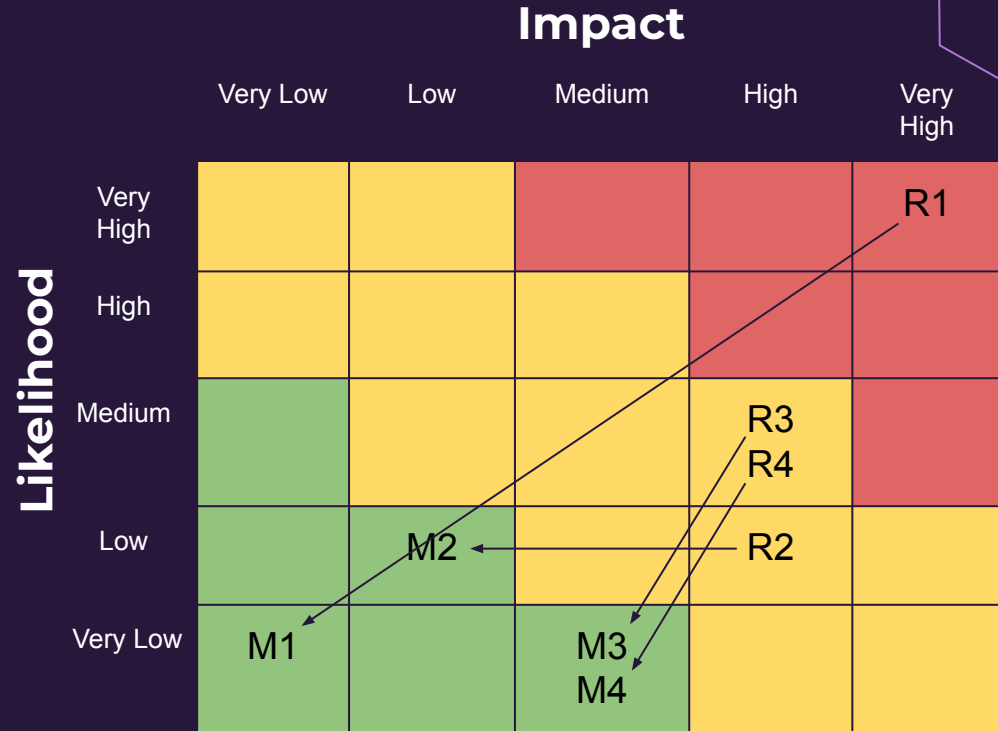
# Security Risks

## Risk

- ◆ **R4:** Model poisoning

## Mitigation

- ◆ **M4:** Separate production data from training data, applying data validation before retraining



# Legal Risks

## Risks

- ◆ **R1:** Machine-generated incorrect results leading to financial loss

## Mitigations

- ◆ **M1:** Keep human-in-the-loop for low-confidence cases, maintain full audit trails, define liability boundaries in contracts, consider professional liability insurance

|            |           | Impact   |     |        |      |           |
|------------|-----------|----------|-----|--------|------|-----------|
|            |           | Very Low | Low | Medium | High | Very High |
| Likelihood | Very High |          |     |        |      |           |
|            | High      |          |     |        |      |           |
|            | Medium    |          |     |        | R1   |           |
|            | Low       |          | M1  |        |      |           |
|            | Very Low  |          |     |        |      |           |



# Legal Risks

## Risks

- ◆ **R2:** Clients' financial data may become vulnerable

## Mitigations

- ◆ **M2:** Encrypt all data at rest and in transit, enforce role-based access

|            |           | Impact   |     |        |      |           |
|------------|-----------|----------|-----|--------|------|-----------|
|            |           | Very Low | Low | Medium | High | Very High |
| Likelihood | Very High |          |     |        |      |           |
|            | High      |          |     |        | R2   |           |
|            | Medium    | M2       |     |        | R1   |           |
|            | Low       |          | M1  |        |      |           |
|            | Very Low  |          |     |        |      |           |

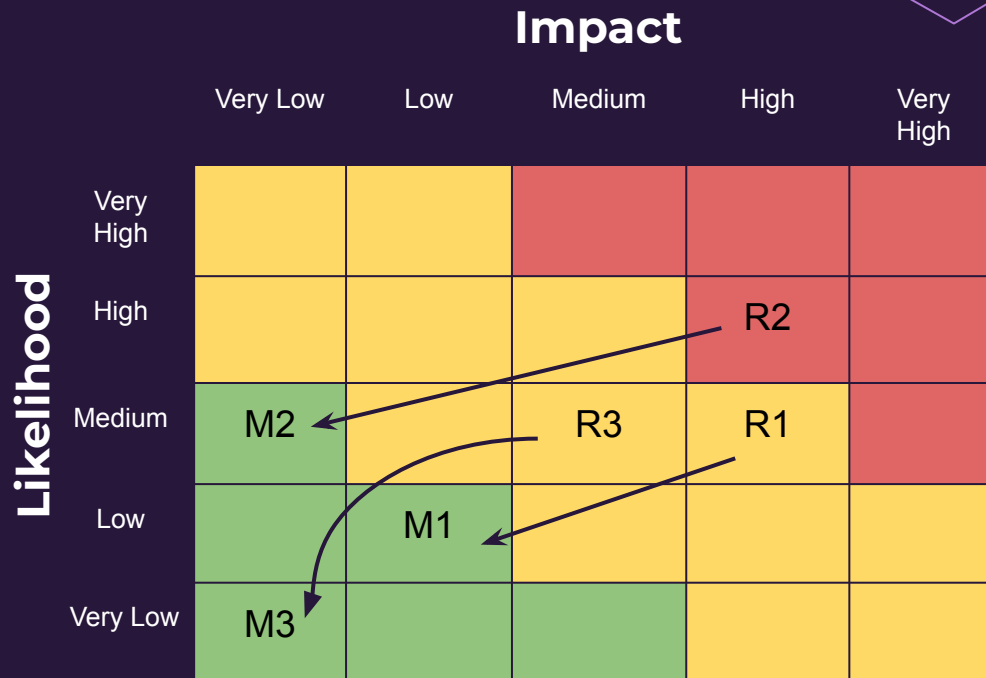
# Legal Risks

## Risks

- ◆ **R3:** Noncompliance with financial record-keeping laws can result in fines or failed audits

## Mitigations

- ◆ **M3:** Implement automated record retention, ensure immutable audit logs, conduct regular compliance checks



# Conclusion - Squaring up AI <sup>2</sup>

- ◆ **The Problem**

- Manual invoice processing costs organizations time, money, and accuracy

- ◆ **Our Solution**

- AI<sup>2</sup> automatically compares invoices to purchasing orders, accelerating processing while minimizing errors and backlogs.

- ◆ **The Difference**

- Reduce processing costs by up to 80%
- Easily scale AP operations
- Free AP teams to focus on strategic, value-added work

# Glossary

- ◆ **Atlantic Diving Supply (ADS):** An American federal contractor company that researches and provides equipments and logistics solutions to the Department of Defense, Federal Agencies, and First Responders.
- ◆ **Purchase Order:** The order list ADS sends to suppliers.
- ◆ **Invoice:** A list of goods sent or services provided, with a statement of the sum due for these; a bill.
- ◆ **Accounts Payable (AP):** The amount still outstanding that a business owes for goods and services purchased on credit, which typically comes due at intervals of 30, 45, 60, or 90 days, depending on the repayment terms.
- ◆ **Oracle:** The system of record for ADS.
- ◆ **APEX:** A strongly typed, object-oriented programming language that Salesforce developers use to execute flow and transaction control statements on the Salesforce platform.
- ◆ **Salesforce:** A robust Customer Relationship Management (CRM) platform allowing businesses to manage their customer relationships efficiently
- ◆ **Supplier:** A person or organization that provides something needed, such as a product or service.
- ◆ **Vendor:** A person or company offering something for sale.

# User Roles

| User Role      | Responsibilities                                                                                                                                                                                                                                                          | Permissions                                                                                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Administrator  | <ul style="list-style-type: none"><li>◆ Adjust AI<sup>2</sup> configurations to meet company needs</li><li>◆ Review previous AI<sup>2</sup> decisions to monitor general performance</li><li>◆ Ensure integrated systems remain compatible</li></ul>                      | <ul style="list-style-type: none"><li>◆ Full System Access (read/write, modify).</li><li>◆ Can manage configurations, user accounts and integrations</li></ul>                      |
| AP Team Member | <ul style="list-style-type: none"><li>◆ Manually review invoices with low-confidence matches or no matches</li><li>◆ Follow up on AI<sup>2</sup> reminders prior to their due dates</li><li>◆ Note corrections for inaccurate matches to improve AI<sup>2</sup></li></ul> | <ul style="list-style-type: none"><li>◆ Limited data access to assigned invoices and queues</li><li>◆ Accesses to AI<sup>2</sup> to make corrections for future accuracy.</li></ul> |

# User Roles Cont.

| User Role          | Responsibilities                                                                                                                                                                                                                                                                                                       | Permissions                                                                                                                                   |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Compliance Officer | <ul style="list-style-type: none"><li>◆ Reviews audit logs for regulatory and financial compliance</li><li>◆ Verify that invoice handling adheres to internal policies and external frameworks (e.g., FedRAMP, DoD RMF).</li><li>◆ Oversee data retention, access logs, and encryption practices.</li></ul>            | <ul style="list-style-type: none"><li>◆ Read-only access to audit trails and financial summaries.</li><li>◆ No modification rights.</li></ul> |
| AI Model Trainer   | <ul style="list-style-type: none"><li>◆ Monitor model accuracy and retrain AI<sup>2</sup> using anonymized invoice data.</li><li>◆ Evaluate false matches and adjust model parameters or retraining schedules.</li><li>◆ Work with administrators to ensure model updates comply with data governance rules.</li></ul> | <ul style="list-style-type: none"><li>◆ Access to anonymized datasets only.</li><li>◆ No Access to live invoice or PO data.</li></ul>         |

# User Stories

## Administrator

As an Administrator, I want AI<sup>2</sup> to authenticate users through ADS's Okta SSO system so that access is secure, compliant, and consistent with ADS's existing authentication policies.

As an Administrator, I want to adjust AI<sup>2</sup>'s configurations—such as confidence score thresholds, routing rules, and notification preferences—so that the system aligns with the company's changing policies and workflows.

As an Administrator, I want to automatically assign incoming invoices to AP team queues based on supplier names.

As an Administrator, I want the system to automatically rebalance supplier assignments between AP queues when workloads become uneven, so that invoice processing remains efficient.

As an Administrator, I want to connect AI<sup>2</sup> to ADS's Outlook inbox using Microsoft Graph API and to Oracle NetSuite through the Alteryx API so that invoices can be automatically pulled, processed, and synced with existing systems.

# User Stories

## Administrator Cont.

As an Administrator, I want to view dashboards summarizing AI<sup>2</sup>'s matching accuracy, queue performance, and integration health so that I can monitor efficiency, detect errors, and ensure compliance with CMMC and FedRAMP guidelines.

As an Administrator, I want AI<sup>2</sup> to be hosted in a FedRAMP-compliant AWS GovCloud environment and maintain audit logs of all user and system actions so that the solution adheres to government security frameworks and can pass compliance reviews.

As an Administrator, I want to receive automatic alerts when integrations fail or when invoice routing encounters errors so that I can take corrective action promptly and maintain operational continuity.



# User Stories

## AP Team Member

As an AP Team Member, I want AI<sup>2</sup> to automatically pull invoice emails and attachments from the shared Outlook inbox using the Microsoft Graph API so that I can see all new invoices in one central dashboard without manually downloading them.

As an AP Team Member, I want AI<sup>2</sup> to flag invoices with low confidence scores and display the potential mismatched fields so that I can correct the data and help the AI learn over time.

As an AP Team Member, I want to view all invoices from my assigned suppliers in a personalized queue so that I can easily track, review, and complete my assigned workload.

# User Stories

## Compliance Officer

As a Compliance Officer, I want to perform routine reviews of AI<sup>2</sup>'s audit logs so that I can confirm that AI<sup>2</sup> is adhering to internal policies.

As a Compliance Officer, I want to verify that invoice handling adheres to federal and state regulatory requirements and guidelines (including but not limited to FedRamp and DOD RMF) so that I can ensure that AI<sup>2</sup> is maintaining compliance.

As a Compliance Officer, I want to ensure that invoice and user data is encrypted both at rest and in transit so that I can ensure AI<sup>2</sup> maintains required data protection standards under CMMC and FedRamp.

As a Compliance Officer, I want to generate periodic compliance and audit reports summarizing access, invoice activity and data handling practices, so that I can document adherence to regulatory requirements.

As a Compliance Officer, I want AI<sup>2</sup> to log all configuration or policy changes made by the administrators, so that I can ensure accountability and verify that no unauthorized adjustments compromise compliance.

# User Stories

## AI Model Trainer

As an AI Model Trainer, I want to document model training guidelines so that other members of my team or future AI Model Trainers have a standardized process to follow.

As an AI Model Trainer, I want to retrain AI<sup>2</sup> so that I can continuously improve upon AI<sup>2</sup>'s pattern recognition.

As an AI Model Trainer, I want to periodically assess AI<sup>2</sup>'s outputs so that I can evaluate how they align with company expectations and predetermined metrics.

As an AI Model Trainer, I want to clean and anonymize invoice data so that I can use it for retraining purposes.

As an AI Model Trainer, I want to be informed of the quality of the invoice matches so that I can improve the algorithm's performance.

As an AI Model Trainer, I want to collaborate with administrators so that I can guarantee that model updates remain compliant with data governance rules.

As an AI Model Trainer, I want to monitor model accuracy so that I can assess AI<sup>2</sup> is meeting internal standards.

As an AI Model Trainer, I want to adjust model parameters and/or retraining schedules so that I can help AI<sup>2</sup> improve accuracy.

# Feature Table

| Category                      | Feature                                     | Administrator                                                                     | AP Team Member                                                                      | Compliance Officer | AI Model Trainer |
|-------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------|------------------|
| Invoice Intake and Processing | Outlook Email Integration (Graph API)       |  |  |                    |                  |
|                               | Invoice Parser and Data Extractor           |                                                                                   |  |                    |                  |
|                               | Automated PO Matching Algorithm             |  |  |                    |                  |
|                               | Invoice Quality Analyzer                    |  |  |                    |                  |
| Queue Assigning and Routing   | Supplier-Based Assigning and Routing System |  |  |                    |                  |
|                               | Queue Assignment Dashboard                  |  |  |                    |                  |

# Feature Table Cont.

| Category            | Feature                                | Administrator | AP Team Member | Compliance Officer | AI Model Trainer                                                                    |
|---------------------|----------------------------------------|---------------|----------------|--------------------|-------------------------------------------------------------------------------------|
| AI Model Management | Model Training and Deployment Pipeline |               |                |                    |  |
|                     | Model Version Control                  |               |                |                    |  |
|                     | AI Performance Dashboard               |               |                |                    |  |
|                     | Invoice Quality Analyzer               |               |                |                    |  |
|                     | Invoice Data Anonymization Pipeline    |               |                |                    |  |

# Feature Table Cont.

| Category                             | Feature                                 | Administrator                                                                     | AP Team Member | Compliance Officer | AI Model Trainer |
|--------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------|----------------|--------------------|------------------|
| System and Configuration Maintenance | Admin Configuration Dashboard           |  |                |                    |                  |
|                                      | System Health and Performance Dashboard |  |                |                    |                  |
|                                      | Error Logging and Recovery Module       |  |                |                    |                  |
|                                      | Admin System Alert Notifications        |  |                |                    |                  |

# Feature Table Cont.

| Category                           | Feature                                    | Administrator                                                                     | AP Team Member                                                                      | Compliance Officer | AI Model Trainer                                                                    |
|------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------|
| Notification System                | Automated Supplier Notifications           |  |  |                    |                                                                                     |
|                                    | Automated AP Team Reminders                |  |  |                    |                                                                                     |
| Confidence Scoring and AI Learning | AI Confidence Scoring Module               |                                                                                   |  |                    |  |
|                                    | Continuous Learning From Human Interaction |                                                                                   |  |                    |  |
|                                    | Human Review Panel                         |                                                                                   |  |                    |  |

# Feature Table Cont.

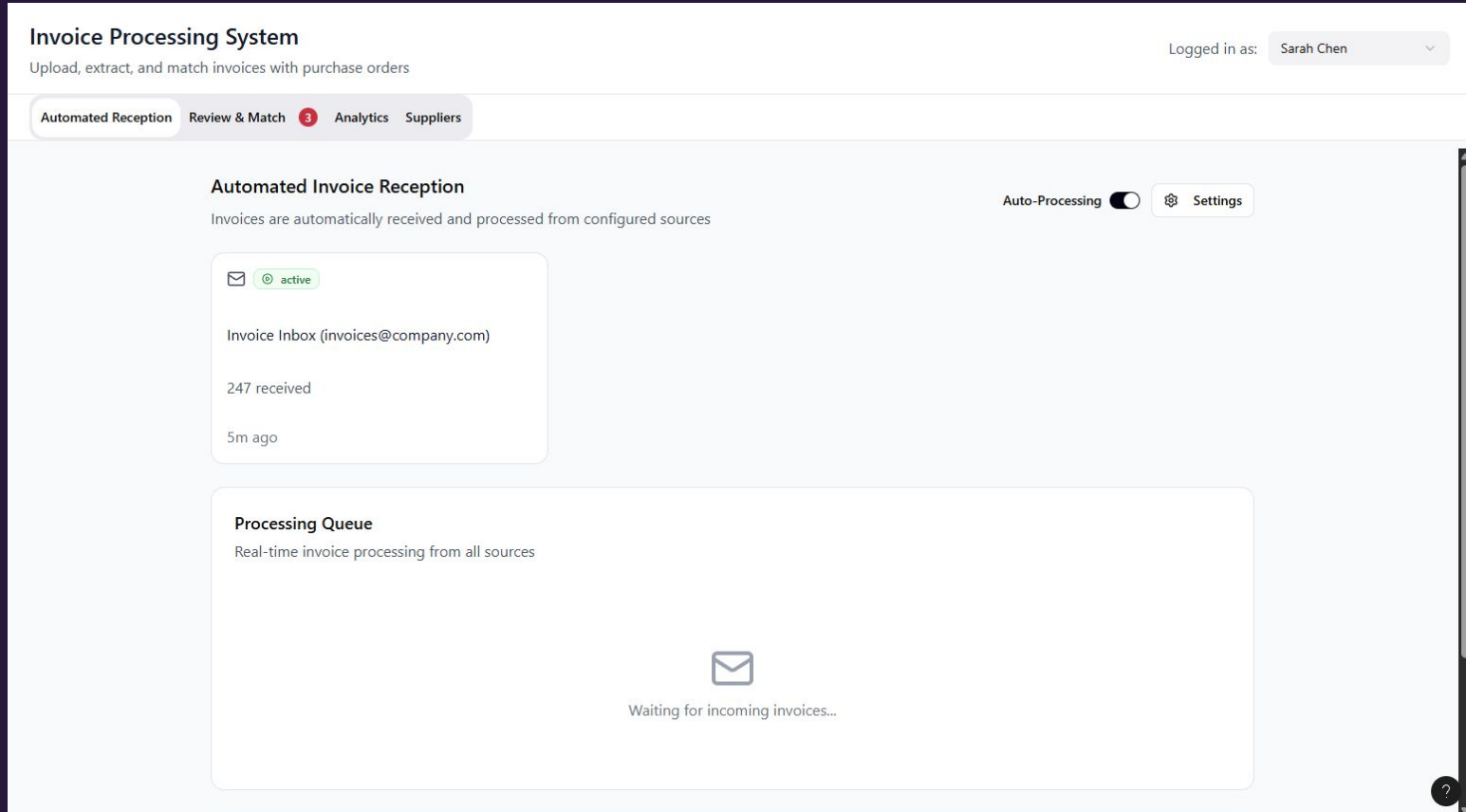
| Category                           | Feature                                | Administrator                                                                     | AP Team Member | Compliance Officer                                                                  | AI Model Trainer                                                                    |
|------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Compliance and Security Monitoring | Encryption Verification Tool           |  |                |  |                                                                                     |
|                                    | AWS GovCloud Integration Tool          |  |                |  |                                                                                     |
|                                    | Audit Log Management System            |  |                |  |                                                                                     |
|                                    | Compliance Changelog System            |  |                |  |                                                                                     |
|                                    | Auto Generated Compliance Report       |  |                |  |  |
|                                    | Compliance Regulations Monitoring Tool |  |                |  |                                                                                     |



# Feature Table Cont.

| Category                          | Feature                           | Administrator                                                                     | AP Team Member | Compliance Officer                                                                  | AI Model Trainer |
|-----------------------------------|-----------------------------------|-----------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------|------------------|
| Authentication and Access Control | Okta SSO Authentication Module    |  |                |  |                  |
| Integration                       | Alteryx-Oracle Integration Module |  |                |                                                                                     |                  |
|                                   | Integration Monitoring Dashboard  |  |                |                                                                                     |                  |

# User Interface Mockups



# Human Review

## Invoice Processing System

Upload, extract, and match invoices with purchase orders

Logged in as: Sarah Chen

Automated ReceptionReview & Match 3AnalyticsSuppliers

### Queue Overview

Confidence Distribution

Low (<50%) 1

Med (50-79%) 2

High (≥80%) 0

Queue Status

Claimed 0

Available 3

Total Pending 3

Total Value

\$22,609

Avg: \$7,536

Performance

Avg Wait: 2.5h

Oldest: 5 days

### Review Queue

Sarah Chen

Available 3My Queue 0In Review 0All 3

Sort by: Match Confidence

INV-2024-1956 Low (28%)

Global Logistics Inc

\$4,521.75 Oct 29, 2024

No matching PO found

INV-2024-1923 Medium (65%)

TechPro Solutions

Select an invoice to review and match

74

# Performance Analytics

## Invoice Processing System

Upload, extract, and match invoices with purchase orders

Logged in as: Sarah Chen

Automated Reception Review & Match **3** Analytics Suppliers

### Analytics & History

Track invoice processing performance and historical data

Last 30 days

Total Processed



54

79.6% success rate

Time Saved



1 days

0h 54m

Matched



43

Successfully matched

Avg Process Time

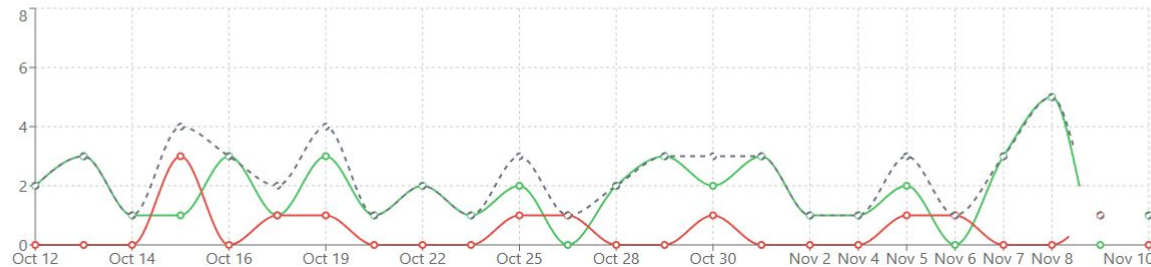


6.7s

Per invoice

Overview By Type Recent History

#### Processing Trend



# Supplier Dashboard

## Invoice Processing System

Upload, extract, and match invoices with purchase orders

Logged in as: Sarah Chen

Automated Reception Review & Match 3 Analytics Suppliers

### Supplier Dashboard

Track high-volume suppliers and manage invoices by due date

+ Add High-Volume Supplier

Total Suppliers



3

2 high-volume

Pending Invoices



3

3 overdue

Due This Week



0

Needs attention

Total Value



\$22,609.25

Outstanding

#### Invoices by Due Date

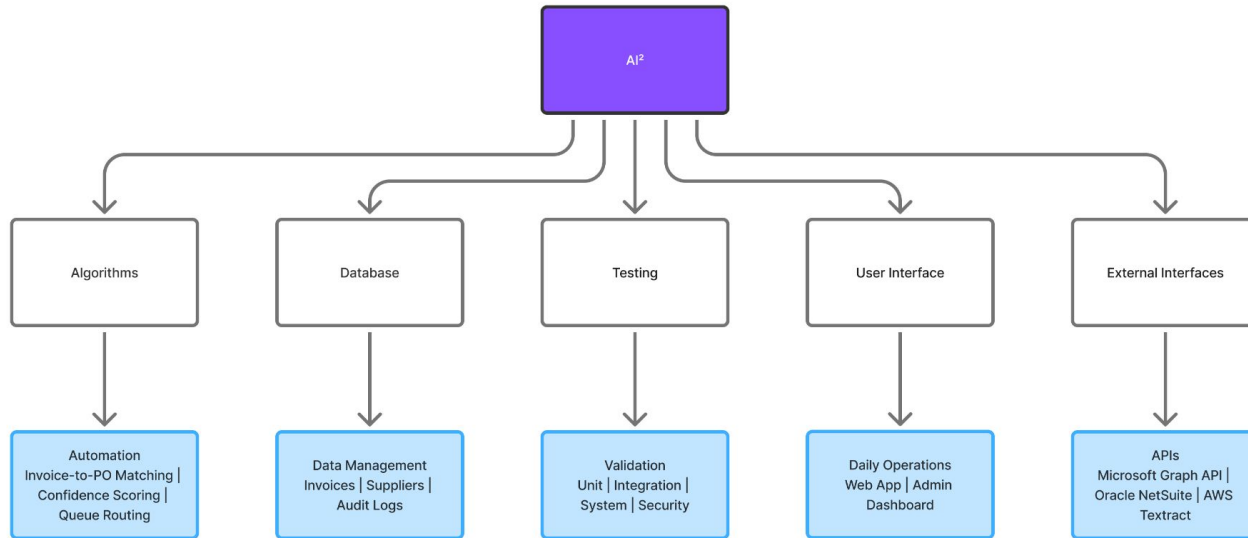
| Invoice #     | Supplier               | Amount     | Invoice Date | Due Date   | Status             |
|---------------|------------------------|------------|--------------|------------|--------------------|
| INV-2024-1847 | Acme Office Supplies ★ | \$2,847.5  | 10/27/2024   | 11/26/2024 | ⚠ 349 days overdue |
| INV-2024-1956 | Global Logistics Inc   | \$4,521.75 | 10/29/2024   | 11/28/2024 | ⚠ 347 days overdue |
| INV-2024-1923 | TechPro Solutions ★    | \$15,240   | 10/28/2024   | 12/12/2024 | ⚠ 333 days overdue |

#### Supplier Statistics

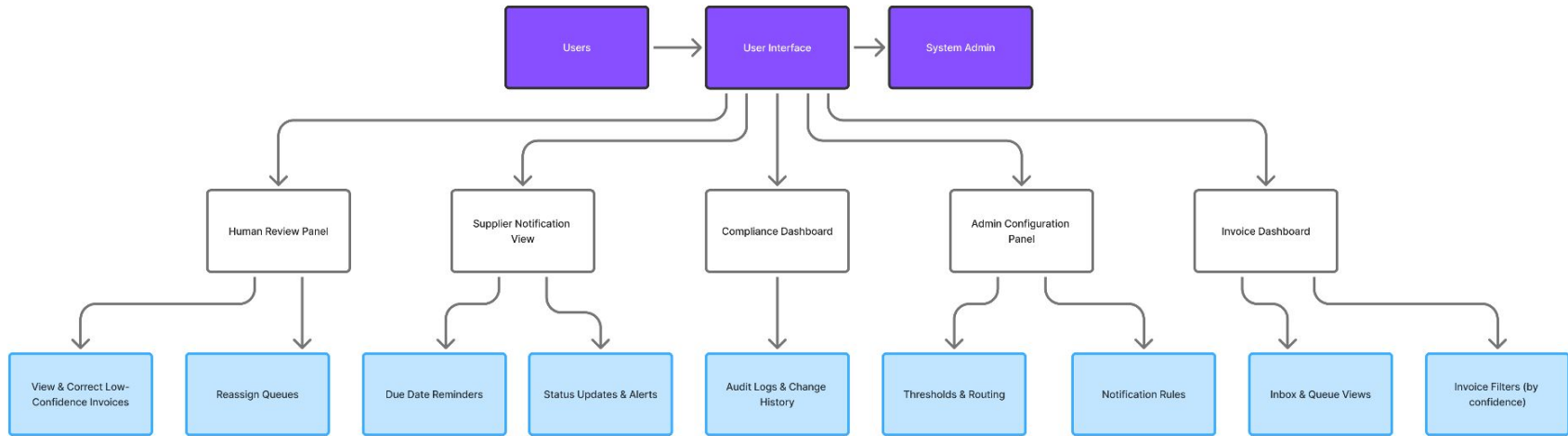
Sort by Latest Invoice



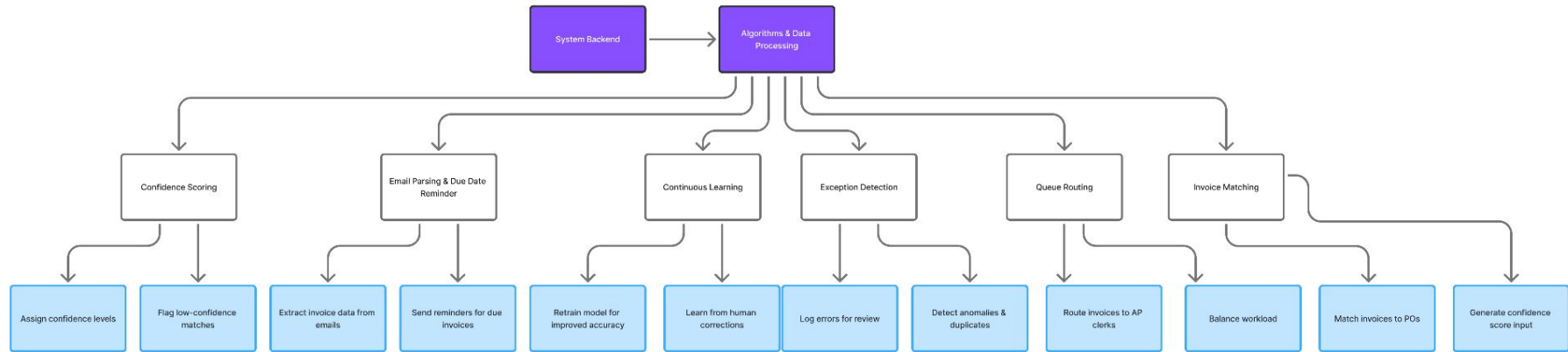
# WBS: System Overview



# WBS: User Interface

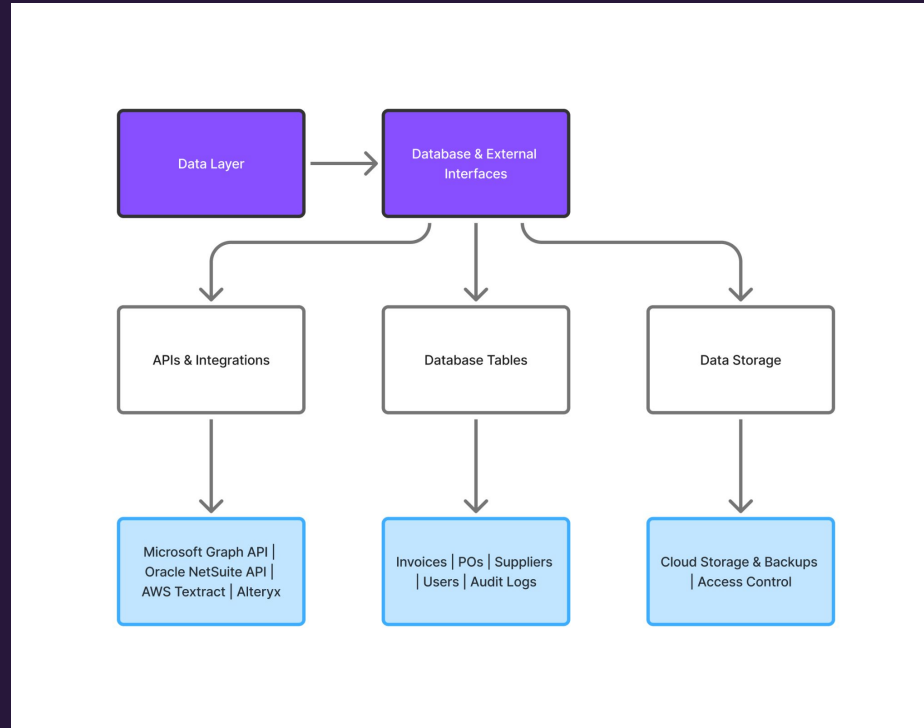


# WBS: Algorithms & Data Processing

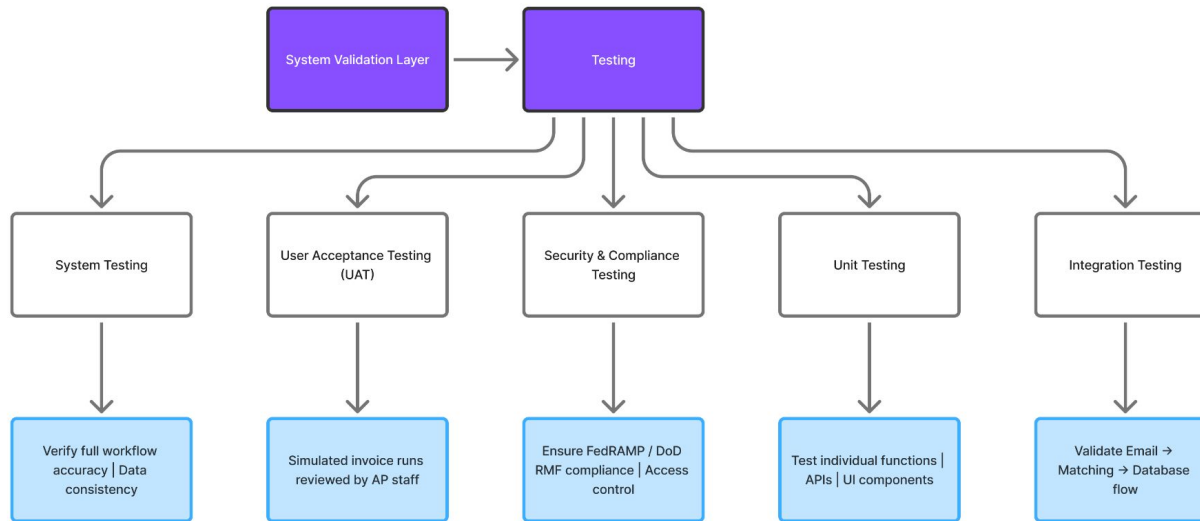




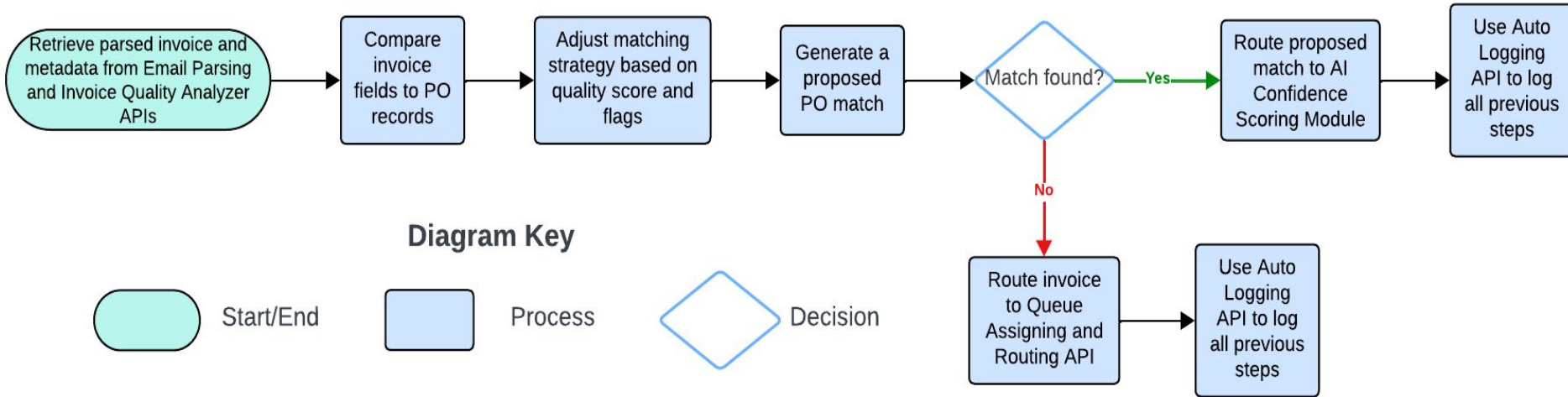
# WBS: Database and External Interfaces



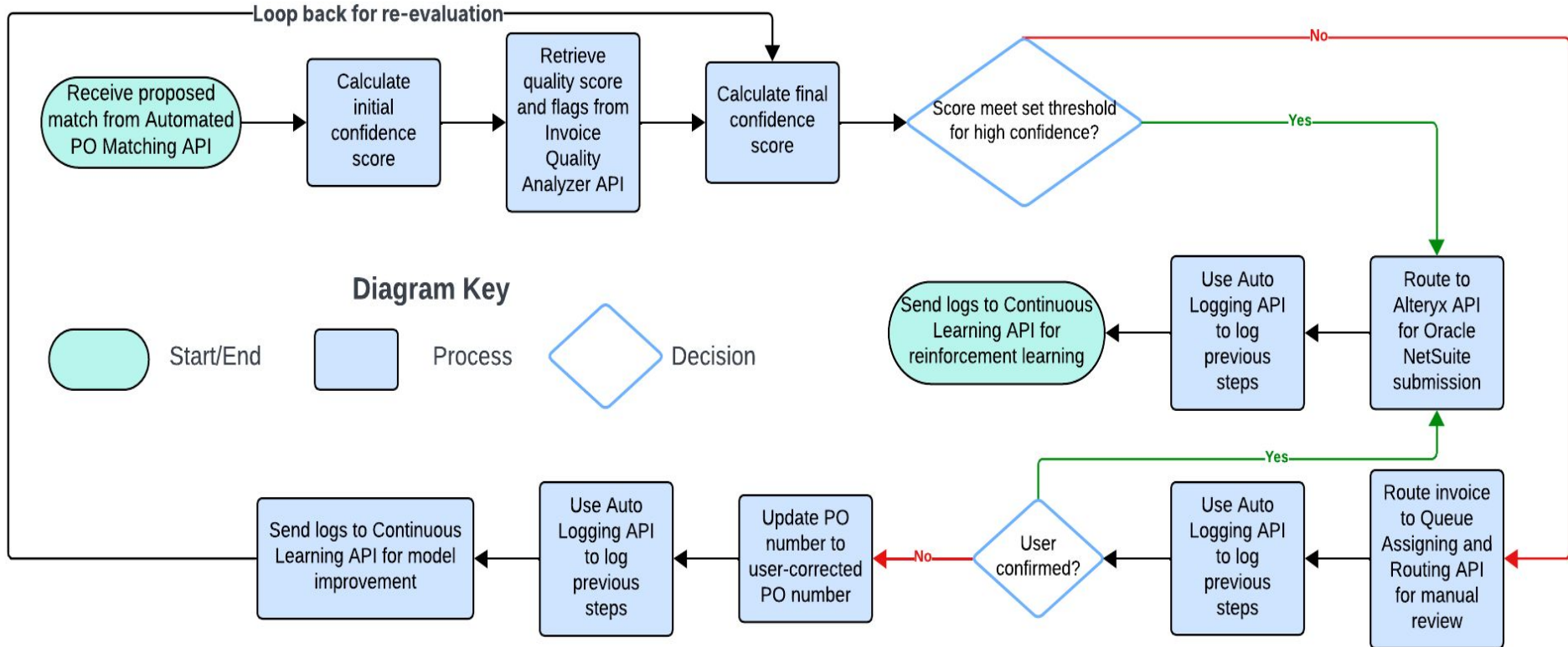
# WBS: Testing and Validation



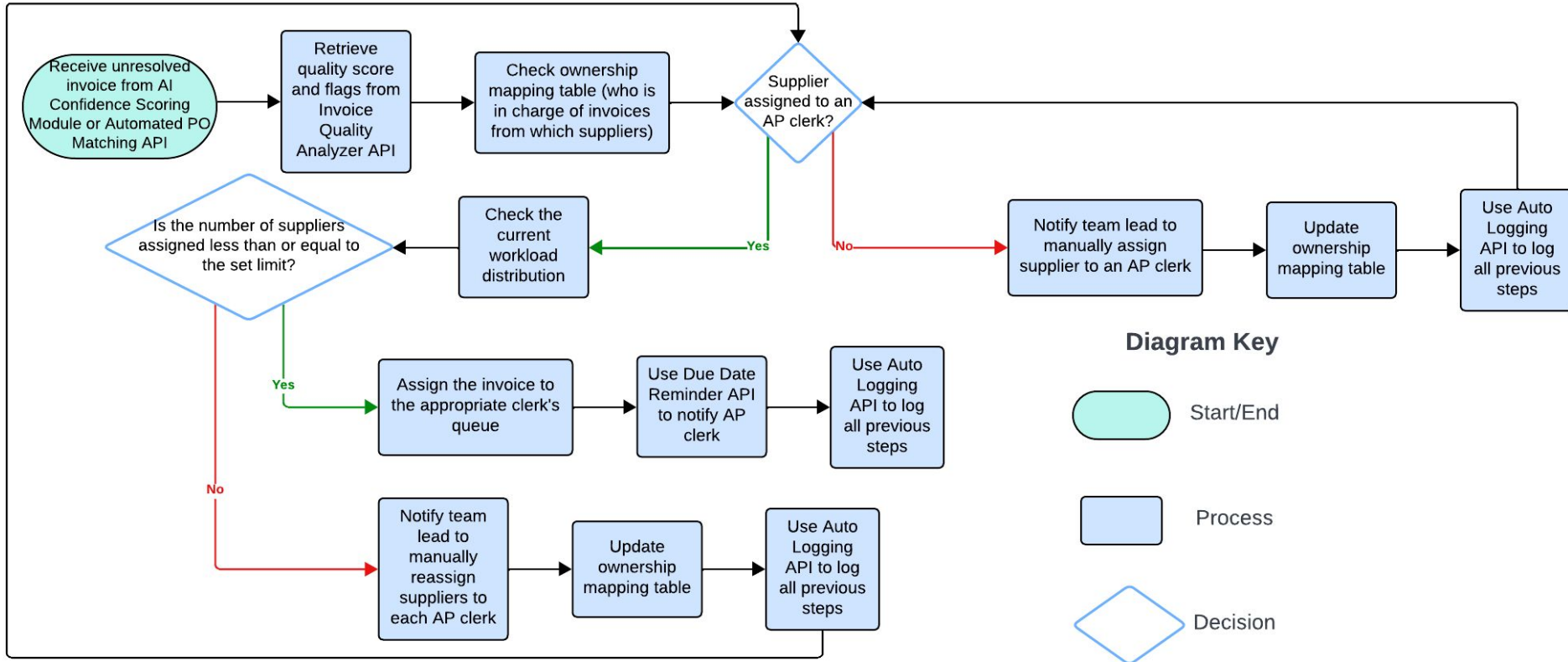
# Automated PO Matching Algorithm



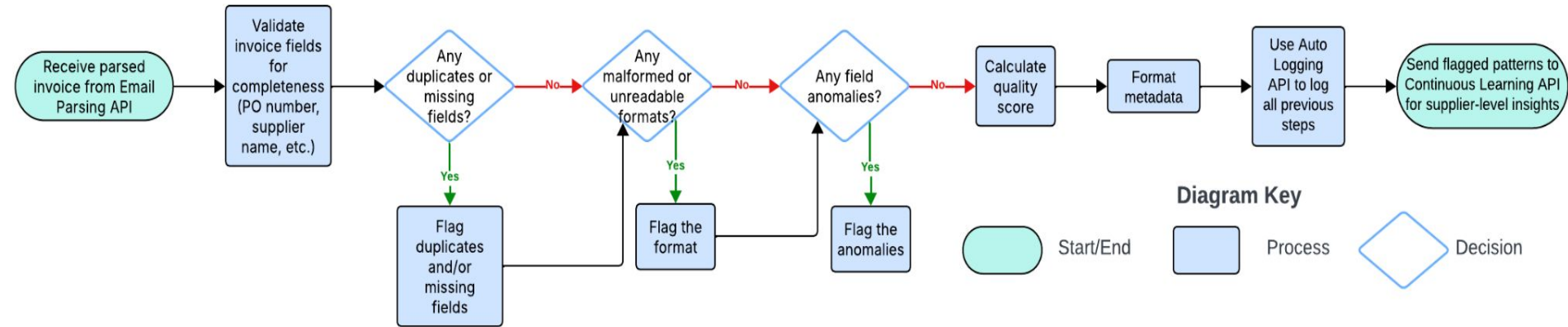
# AI Confidence Scoring Module



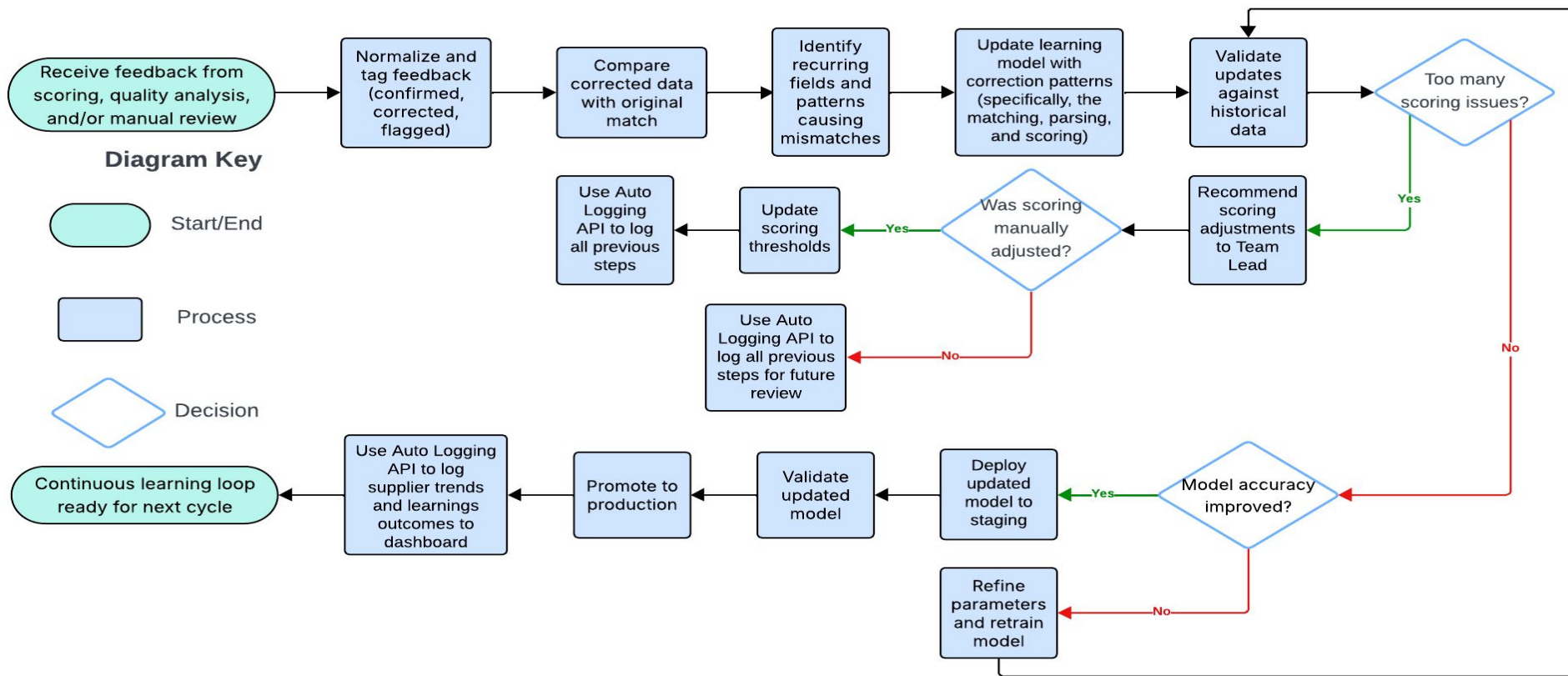
# Queue Assigning and Routing



# Invoice Quality Analyzer Algorithm



# Continuous Learning Algorithm



# Email Parsing Algorithm

## Diagram Key



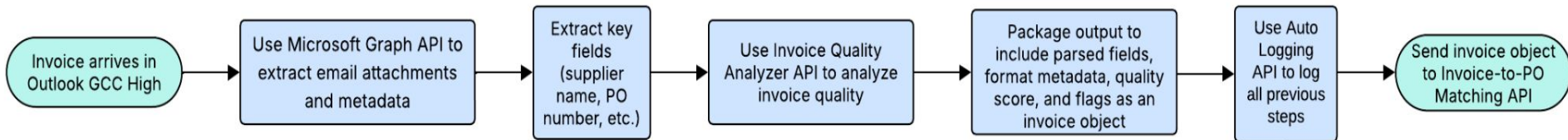
Start/End



Process

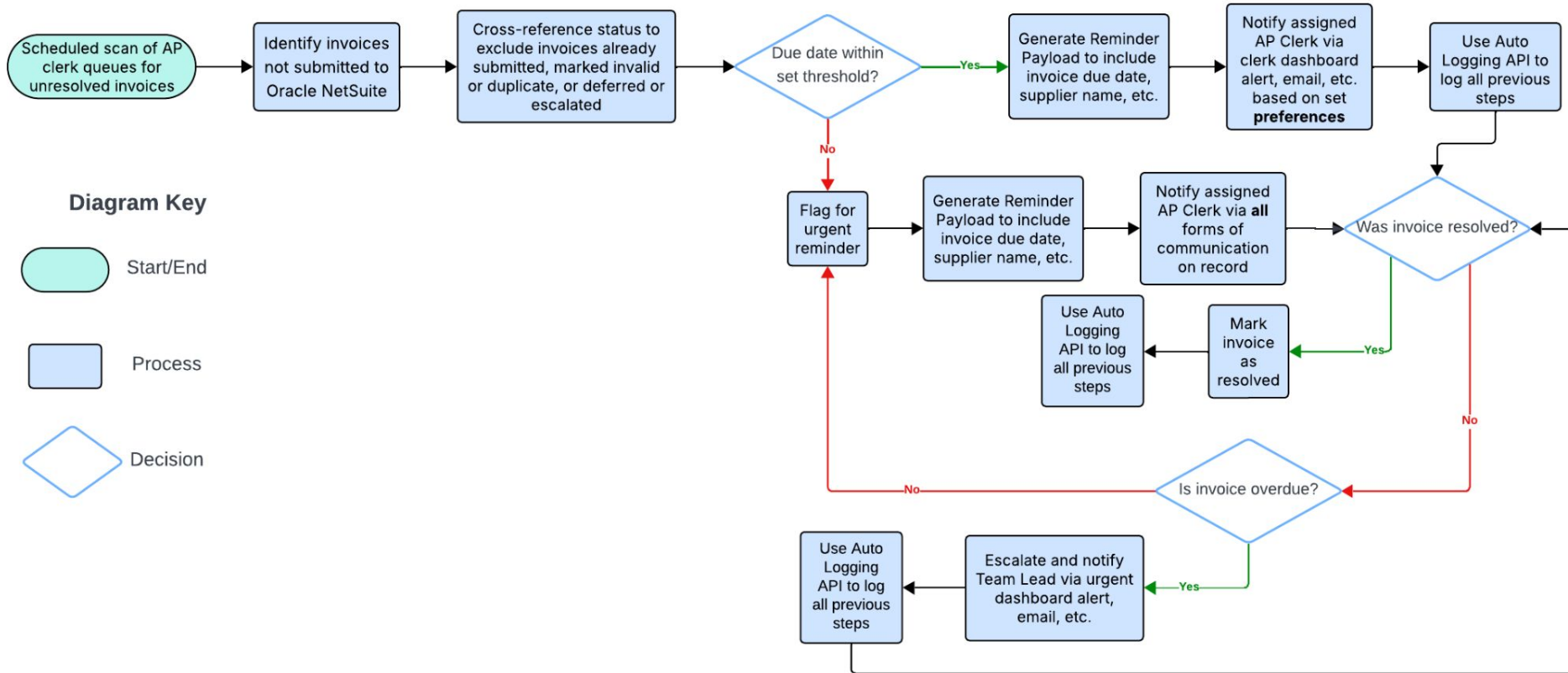


Decision

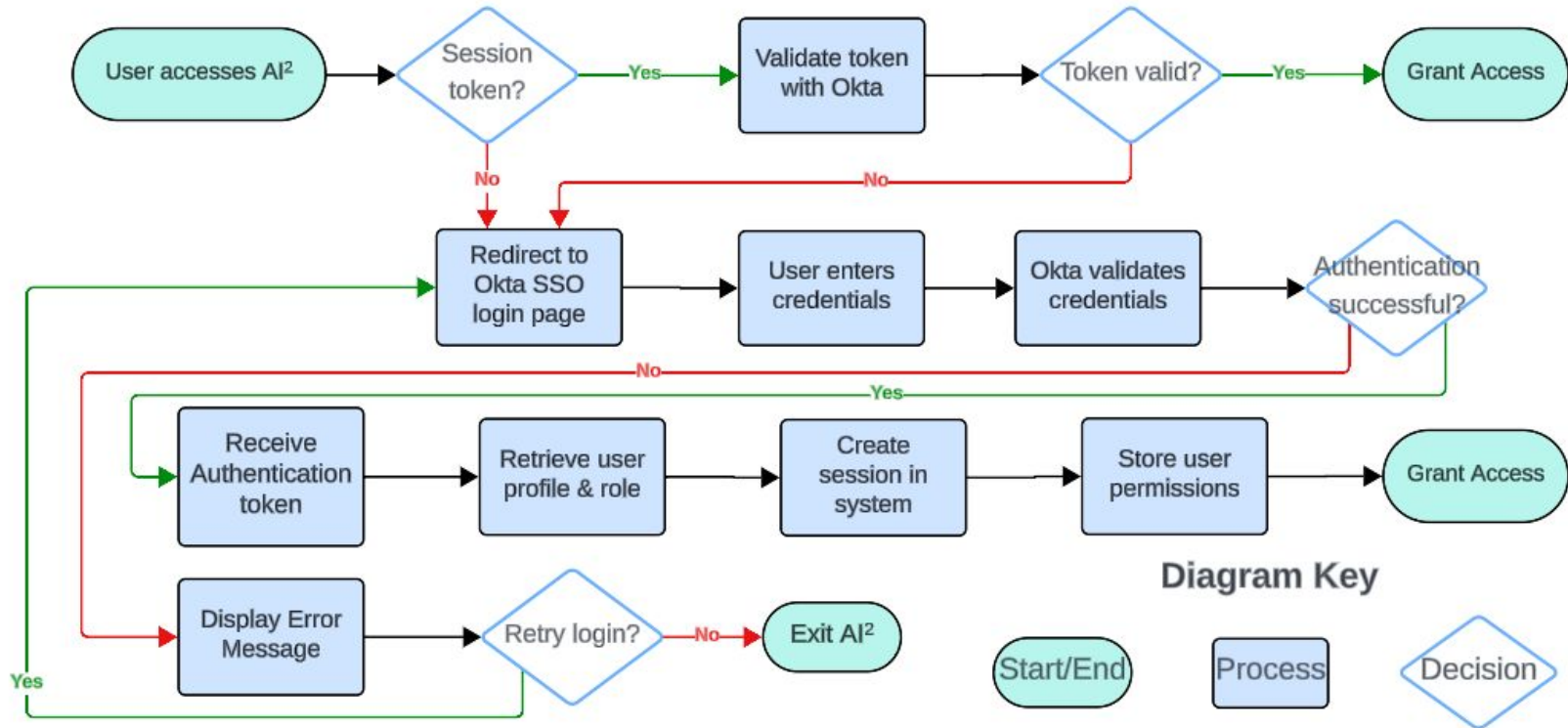




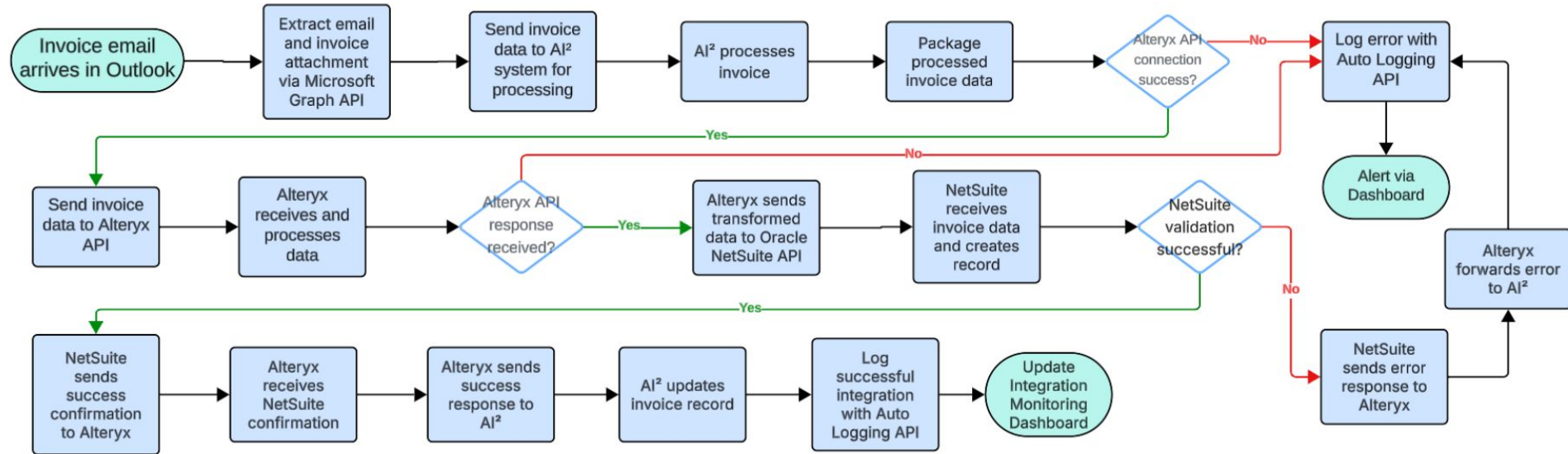
# Due Date Reminder Algorithm



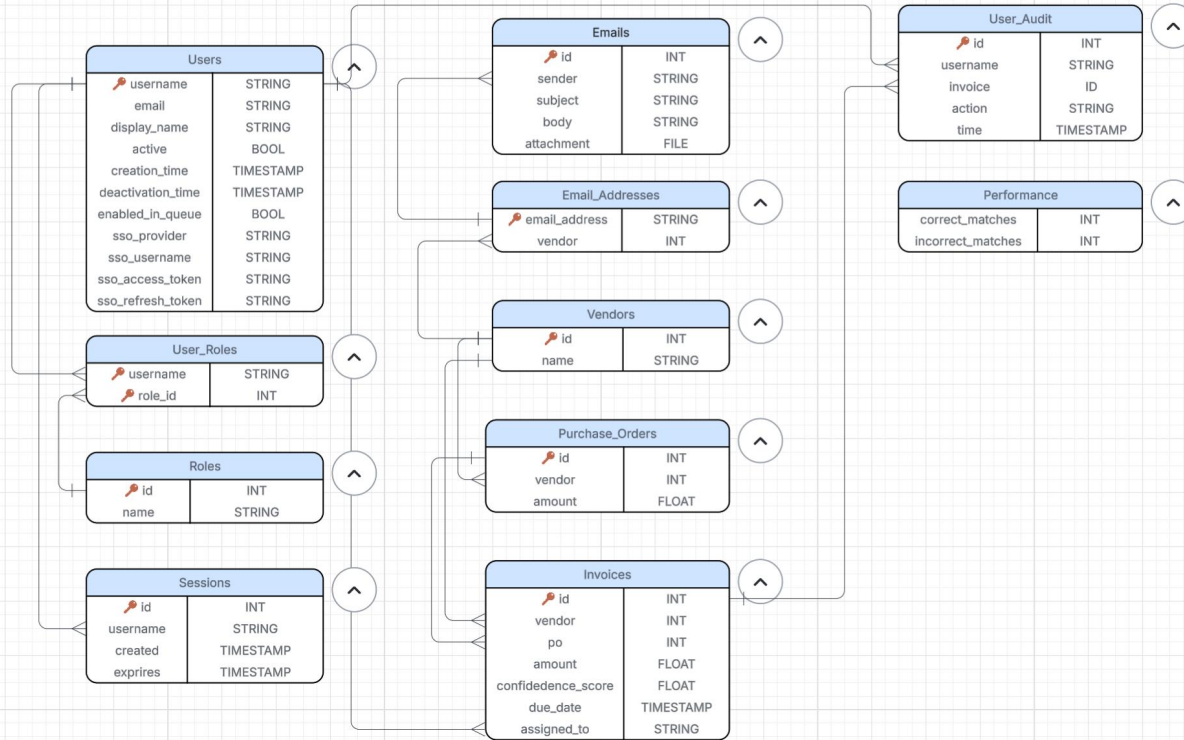
# Authentication Algorithm



# Integration Algorithm



# Database Schema



# Sprint Breakdown

## 1. Foundation

- Basic application
- User Interface

(AP Team Member)

## 2. Integration

- w/ Outlook Inbox
- Oracle NetSuite

(Administrator User Story)

## 3. Authentication

- Integrate ADS Okta SSO (role-access)
- Security clearance

(Administrator User Story)

## 4. Configurations:

- Confidence thresholds
- Routing rules
- Notifications

(Administrator User Story)

## 5. Queues + Flagging

- Assign invoices to AP'S
- Flagging invoices w/ low confidence for AI training

(AP Team Member)

## 6. Training

- Pattern recognition
  - Improve accuracy
- (AI Model Trainer)

## 7. Reports

- Summaries on accuracy
- Audit logs to adhere to federal + state guidelines

(Compliance Officer)

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