L**ab 2 – AI2 Product Specification**

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March 21, 2026

Version 1

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1 Introduction

1.1 Purpose

This document provides an outline of the AI² application, giving sufficient guidance for a software development team to implement it without being prescriptive on what technologies are to be used.

1.2 Scope

Many organizations handle tens of thousands of invoices annually, predominantly through manual processes that create inefficiencies and risk. Manually handling those invoices can cost between twelve and thirty-five dollars per invoice. This is two to three times the cost of automating that process (Tamaro, 2025).

Manually matching incoming invoices to existing purchase orders leads to delays, data entry errors, and backlogs across accounting departments. A computer-automated system is better suited to this task. According to Megan O'Brien, content strategist for Oracle, automating financial processes can reduce errors, fraud, time and costs while increasing visibility, efficiency, and collaboration (2024).

AI² reduces manual workload, accelerates invoice turnaround, bolsters supplier satisfaction, and improves data accuracy with AI-driven recommendations.

AI² leverages artificial intelligence to match invoices to POs with confidence scoring, giving companies the insight on what invoice-PO matches need reviewing, which in turn improves model performance.

AI² improves efficiency, accuracy, adaptability, transparency, and scalability over manual processing. An API that pulls invoices from Emails, another that pulls PO information from a company's ERP, and a third that places the matched invoice into the ERP improves efficiency from end to end. The automation also removes human error to improve accuracy. The accuracy also improves over time with the model training inherent in the process, adapting the model to the company's unique challenges. Confidence scores and logs provide end users the transparency needed to trust the software is making appropriate decisions. Finally, automation makes the process scalable, eschewing the need for additional staffing as volume increases.

1.3 Definitions, Acronyms, and Abbreviations

Atlantic Diving Supply (ADS): An American federal contractor company that researches and provides equipment 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.

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1.5 Overview

The remainder of this document will describe the major functional components of the software. It will also describe what is to be created in the prototype and in a real-world product.

This document will also cover typical what users are expected to be interacting with this software so that it can be created to meet their needs.

Finally, this document will go over constraints on the software, as well as what other types of software AI² will commonly have to interact with.

2 Overall Description

2.1 Product Perspective

AI2 is an end-to-end solution, from invoice intake to sending the match to an ERP solution.

Any secured application begins with authentication. AI² works with a company's existing SSO or LDAP solution to make the process as seamless as possible.

Once logged in, a member of the AP team can access their assignment queue where they can see what matches need their review. Managers can log in to manually assign invoices or allow the system to automatically assign work. AP team members can place themselves in or remove themselves from the queue – or a manager can manage team members in the queue.

Managers and administrators can access a summary dashboard to view performance and audit logs. There, they can also access the confidence scores of each match.

If a match does have a low confidence score, the results of the human review is fed back into the AI model so that the application can learn the edge cases the company faces to improve matching reliability.

To further enhance efficiency, AI² has an API to pull invoices directly from an Email inbox, beginning the process. This pushes the invoice to a programmatic algorithm to see if the invoice can be immediately matched to an invoice.

Table 1

Features and Capabilities

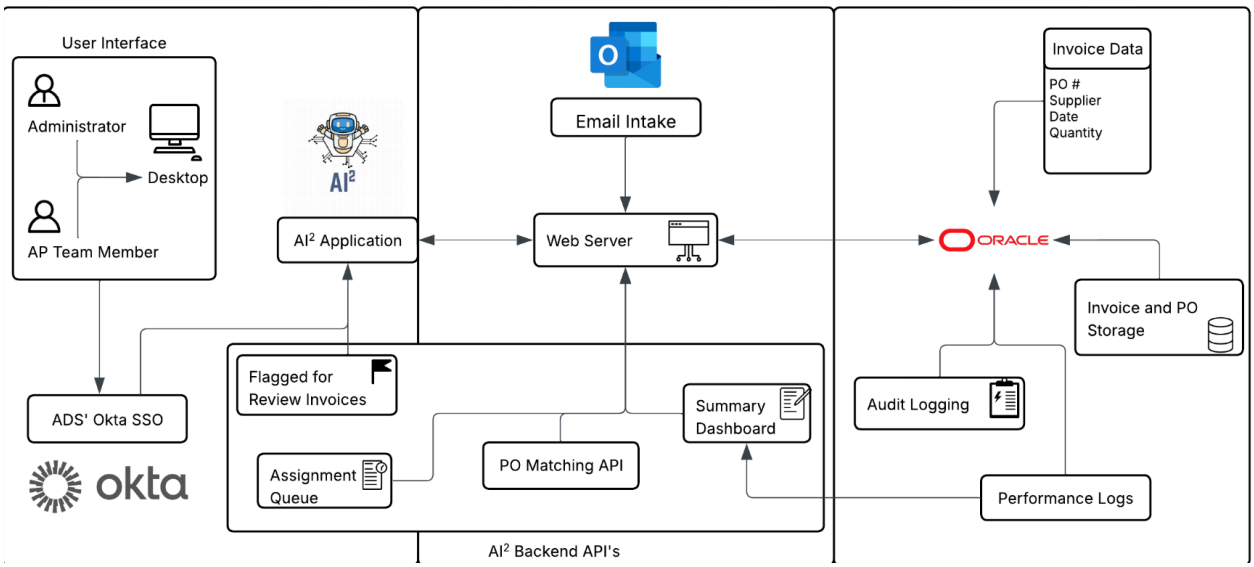
Feature	**Description**
Authentication	Integrates with a company's SSO or LDAP solution.
Assignment Queue	Match reviews can be assigned automatically or manually.
Summary Dashboard	Interface for performance and audit logs.
Confidence Scoring	Provides transparency on the model's confidence of a match.
Continuous Learning	Feeding manual matches into the AI model allows companies to cover edge cases.
Email Intake	Pulls invoice directly from the inbox.
PO Matching API	Matches invoices to existing POs with AI when they cannot be programmatically matched and enters those matches into the company's ERP.
Audit Logging	Provides administrators insights into how the software is matching invoices to POs.
Performance Logs	Gives management data to evaluate system performance and allows administrators to judge the efficacy of different models.

If not, the invoice is then fed to the PO matching API, where artificial intelligence is used to evaluate the invoice against existing POs to find a match. The AI assigns a confidence score. If the confidence score is high enough, the match is automatically fed to the company's ERP. Otherwise, it is added to the assignment queue. Table 1 provides an outline of AI²'s features and capabilities.

AI² is a web application. Therefore, it can be accessed from any computer running a modern web browser. The user interface will vary depending on the role a user may have, removing unnecessary clutter while retaining the features needed to accomplish their job. Figure 2 shows a diagram of the major functional components of AI².

Figure 2

Major Functional Components Diagram



Once a member has logged in through Okta SSO, they will see dashboards that show their assignment queue, invoices flagged for review, and purchase orders that the PO matching API will suggest to match invoices to.

Administrators will login to access performance logs, audit logs, and a summary dashboard.

Bookending this entire process is the Email intake API that will automatically ingest incoming invoices and an ERP API that gathers purchase orders and saves its corresponding matched invoice. These APIs further time savings by automating tasks that would take much longer if done manually.

AI² stores its own information on matches, performance, and AI models in a database.

2.2 Product Functions

Missing from a prototype but necessary for a final product would be an integration with a customer's Email system. This is how invoices will be gathered into the system to be matched to a PO.

The next function of AI² is an invoice parser and data extractor, which will provide the data necessary for the following function, the automated PO matching algorithm. Both of these functions should be fully implemented in both the prototype and its real-world product.

The invoice quality analyzer – which is how well the OCR is able to read the invoice, how well the AI is able to interpret the data on the invoice, and how complete the information on the invoice is – should also be implemented fully in the prototype.

Queue assigning and routing and the queue assignment dashboard need only be partially implemented in the prototype. The dashboard will give the AP manager the ability to assign work to different members of the AP team. The AP manager will generally assign work to agents by customer, but more fine-grained controls shall be offered for when it is necessary.

The model training and deployment pipeline, model version control, and the AI performance dashboard shall be fully implemented in the prototype. The dashboard gives the model trainer the opportunity to train and deploy new models – as well as reverting back to previous versions. The invoice data anonymization pipeline, while important in production, can be omitted in the prototype.

The admin configuration dashboard, system health and performance dashboard, and admin system alert notifications need only be partially implemented in the prototype, while the error logging and recovery module shall be fully implemented. The admin will not only be monitoring hardware resources, but they will also need to configure integrations with other systems, such as Email and ERP.

Automated supplier notifications need not be included in the prototype, and the automated AP team reminders need only be partially implemented. However, the AI confidence scoring module, the ability to continuously learn from human interaction, and the human review panel should all be fully functional in the prototype.

Compliance features, such as the encryption verification tool, AWS GovCloud integration tool, automatically generated compliance report, and compliance regulation monitoring tool are

unnecessary for the prototype. Meanwhile, the audit log management system and compliance changelog system require only partial implementation in the prototype.

Finally, third-party integrations should not be implemented: the Okta SSO authentication module, the Alteryx-Oracle integration module, or the integration monitoring dashboard.

2.3 User Characteristics

For users, there will be five categories: administrator, AP manager, AP team member, compliance officer, and model trainer.

The administrator will be a member of the IT department tasked with monitoring hardware performance of the machine it is running on. They will also be responsible for third-party integrations: Email, authentication, and ERP. Finally, they will track any errors coming from the software.

The AP manager will assign work to team members. The manager will also monitor the performance of the system as well as employee performance.

The AP team member will review the AI-matched invoices as well as performing manual matches when the AI falls short. They will require access to the invoice quality analyzer results as well as the AI confidence score.

The compliance officer will need access to logs, including the audit logs and the compliance changelogs. They will also need access to compliance reports and the compliance regulations monitoring tool.

Finally, the model training will require access to any model training and deployment tools as well as the AI performance dashboard so that they can monitor the results of any changes to the model.

2.4 Constraints

AI² shall stand up to any compliance required by various industries. Government contractors require the assurance of the Department of Defence compliance. AI² shall provide the information security and transparency to survive the scrutiny of the most difficult audit.

2.5 Assumptions and Dependencies

AI² is dependent upon APIs to access corporate authentication, Email, and ERP systems to maximize the benefit of invoice automation and maximize the benefits of using the software.