

AI SOLUTION SHOWCASE

Construction Submittal Intelligence

From dense specification PDFs to validated, package-ready product documentation.

A construction technology platform was built for trade contractors, general contractors, design teams, and project managers to simplify the submittal workflow. In construction projects, teams often review long specification PDF sections to identify required products, product data sheets, SDS/MSDS, installation instructions, certificates, compliance documents, and validation requirements.

Project classification: This solution showcase presents an AI-assisted construction workflow for specification extraction, product-document discovery and submittal validation.



INDUSTRY	CLIENT TYPE	EVIDENCE
Construction Technology	Construction workflow platform	Projected
DELIVERY SCOPE		
Specification extraction, search and document validation		

Reduced repetitive specification-review effort	Faster discovery of supporting product documents	Requirement-to-document traceability
Automated extraction reduces the amount of repetitive reading required to identify product and document requirements.	Contextual search helps teams locate relevant data sheets, manuals, certificates and supporting PDFs more efficiently.	Validation findings retain a connection between specification requirements and selected product documents.

01 / BUSINESS CONTEXT

Who needed the solution

A construction technology platform was built for trade contractors, general contractors, design teams, and project managers to simplify the submittal workflow. In construction projects, teams often review long specification PDF sections to identify required products, product data sheets, SDS/ MSDS, installation instructions, certificates, compliance documents, and validation requirements. The platform was designed to help users upload specification PDFs, automatically extract product and submittal requirements, search for supporting documents, validate selected product documents against the project specification, and generate package-ready outputs. The user manual describes this workflow as an AI-powered process for extracting product information, finding relevant product data sheets, and validating compliance with project requirements.

02 / CHALLENGE

What needed to change

Construction submittal preparation is slow, repetitive, and error-prone. Teams manually read dense specification sections, identify required products, search online for supporting product documents, and compare those documents against project requirements.

Long specification PDFs contained dense construction language	Long specification PDFs with complex construction language.
Product and submittal requirements were spread across sections	Product and submittal requirements hidden across multiple sections.
Supporting documents had to be found manually	Teams manually read dense specification sections, identify required products, search online for supporting product documents, and compare those documents against project requirements.
Selected product documents still required compliance checking	Product and submittal requirements hidden across multiple sections.

Missing requirements could lead to rework or rejected submittals

High risk of missed requirements, incomplete packages, RFIs, or rejected submittals.

03 / WORKFLOW TRANSFORMATION

Before and after

Previous workflow

- Long specification PDFs contained dense construction language
- Product and submittal requirements were spread across sections
- Supporting documents had to be found manually
- Selected product documents still required compliance checking
- Missing requirements could lead to rework or rejected submittals

Structured workflow

- Parse specification PDFs
- Extract submittal requirements
- Discover supporting documents
- Validate and prepare outputs
- Review structured outputs

04 / SOLUTION

How we approached it

The solution was built around a full submittal workflow: Upload Spec PDF → Extract Products/ Submittals → Select Product → Smart Search Documents → Validate Against Spec → Generate Reports / Package The platform uses AI to process uploaded construction specification sections and extract product information, technical requirements, approved manufacturers, references, and required documentation. Since specs can be long and dense, a chunking and minification strategy was used to process large PDFs without losing important requirement context.

01

Parse specification PDFs

Preprocess and chunk project specifications while preserving useful context.

02

Extract submittal requirements

Identify products, manufacturers, technical conditions and required document types.

03

Discover supporting documents

Generate product-aware searches and rank relevant data sheets, manuals and certificates.

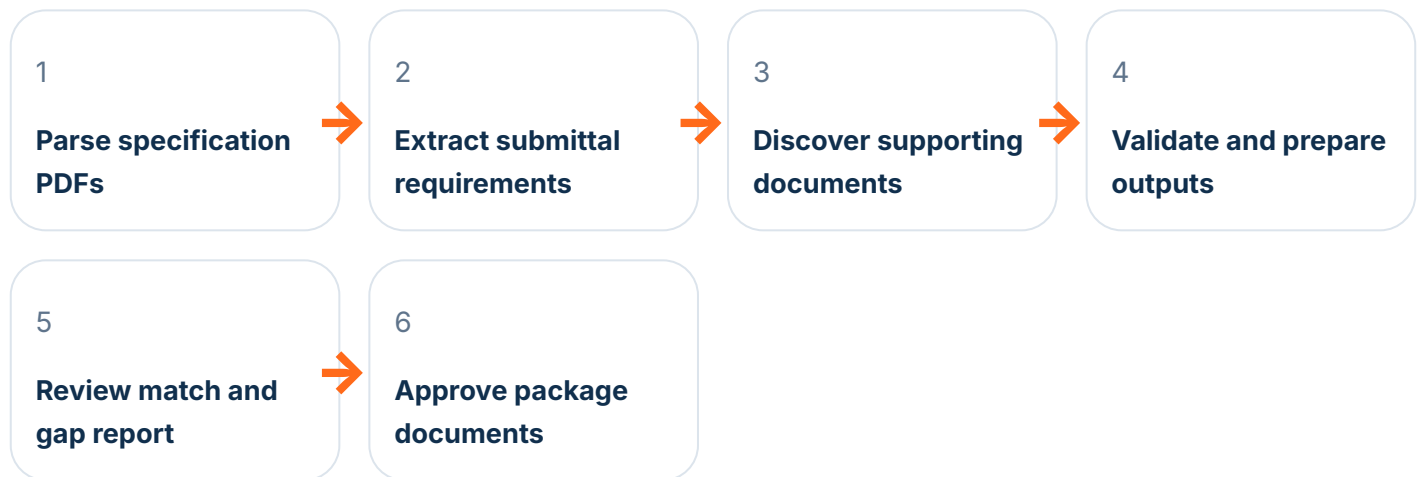
04

Validate and prepare outputs

Compare selected documents with requirements and produce match, gap and review information.

05 / EXAMPLE WORKFLOW

From input to reviewable output



06 / DELIVERY SCOPE

What the delivery covered

Construction workflow

- Specification upload and preprocessing
- Product and submittal requirement extraction
- Supporting-document discovery
- Validation report and package workflow

AI and document processing

- Gemini-based structured extraction
- Long-PDF chunking and context preservation
- Contextual search-query generation
- Requirement-to-document matching and scoring

Application engineering

- React workflow interface
- Python processing services
- Single-file and batch validation
- Downloadable review outputs

Scope boundary

This public version presents the implemented workflow as a solution showcase. It does not claim quantified time savings or production-scale impact.

07 / ARCHITECTURE AND CONTROLS

How the system is organised

Google Gemini

React

Python

Requirement-level validation

Selected product documents are checked against extracted specification requirements and unmatched items are surfaced.

Confidence and review

Search and validation outputs remain reviewable before documents are accepted into a package.

Source traceability

Findings retain a connection to specification context and supporting product documents.

08 / BUSINESS VALUE

Expected operational value

- | | | |
|---|---|-----------|
| 1 | Reduced repetitive specification-review effort
Automated extraction reduces the amount of repetitive reading required to identify product and document requirements. | Projected |
| 2 | Faster discovery of supporting product documents
Contextual search helps teams locate relevant data sheets, manuals, certificates and supporting PDFs more efficiently. | Projected |
| 3 | Requirement-to-document traceability
Validation findings retain a connection between specification requirements and selected product documents. | Projected |
| 4 | Earlier visibility of missing or unmatched requirements
Match and gap outputs surface missing or unsupported requirements before package review. | Projected |
| 5 | | Projected |

A repeatable path towards package-ready review outputs

The workflow provides a repeatable route from specification upload to reviewable package outputs.

09 / TECHNOLOGY

Technology and component roles

GO

Google Gemini

Structured extraction, reasoning or generation

RE

React

Reviewer or product user interface

PY

Python

AI, data-processing and backend logic

10 / RELATED WORK

Explore related case studies

INSURANCE & COMPLIANCE

InsureAI

RAG-based policy review, real-time knowledge retrieval and automated policy-gap analysis.

CYBERSECURITY & COMPLIANCE

CMMC Compliance AI Backend

Agentic RAG, NIST-grounded reasoning and structured compliance-document generation for CMMC workflows.

HEALTHCARE & CLINICAL RESEARCH

Clinical Data Harmonization

Hybrid RAG and fine-tuned small language models for explainable source-to-standard clinical data mapping.

Working on a similar challenge?

Discuss the workflow, data, integrations and evidence required for a practical first release.