



AI-Powered Moving and Relocation Technology



United States

BundleBox **Takes AI Video Surveying** from Ideation to Production with **iOPEX Engineering** Powered by Claude Code

BundleBox is an AI technology startup building vertical SaaS for the US moving industry. To make remote property surveys more scalable and operationally useful, BundleBox engaged iOPEX to engineer an AI-powered workflow that converts customer walkthrough videos into structured, evidence-backed moving inventories ready for downstream review and quotation.

Highlights

- BundleBox needed to convert **10–20 minute customer walkthrough videos into dependable inventory data** without losing room context, duplicating items, or accepting uncertain observations as fact.
- iOPEX used **Claude Code across solution architecture, implementation, debugging, refactoring, testing, and documentation** to engineer an evidence-grounded video-processing pipeline with deterministic controls and human review.
- The solution now **converts walkthrough video into structured, room-level inventory with item evidence, packed groups, special-handling indicators, and review workflows**, while constraining evidence timestamps to the actual source-video duration.

Business Challenge

A moving survey is a critical input to what follows—the inventory, quotation, planning requirements, and eventually move-day execution.

BundleBox wanted to make this stage more scalable by enabling customers to complete remote property walkthroughs instead of relying entirely on manually interpreted surveys.

A typical remote survey contains **10–20 minutes of conversational video**. Turning that footage into useful operational data requires considerably more than identifying objects frame by frame.

The system must understand when a customer moves from one room to another, distinguish between items mentioned and items visually observed, prevent the same object from being counted repeatedly, capture packed or grouped belongings correctly, and retain evidence that reviewers can trace back to the source.

Accuracy of that evidence was particularly important.

During early processing, an observed run associated approximately **26 minutes of evidence timeline with a source video of roughly 17 minutes**. The issue illustrated a broader engineering requirement: automatically generated inventory could not simply appear plausible; every item and timestamp needed to remain grounded in the original survey.

BundleBox therefore required a technology provider that could engineer the survey workflow for both **automation and verifiability**, while retaining human oversight for ambiguous cases.

iOPEX Solution

iOPEX designed and implemented an evidence-grounded AI survey pipeline that transforms unstructured customer walkthroughs into structured inventory data.

To accelerate and strengthen development across the processing workflow, **iOPEX embedded Claude Code into the software engineering lifecycle.**

Claude Code was used as a human-supervised engineering agent across architecture, implementation, refactoring, debugging, testing support, and technical documentation. It worked with approved requirements, repository context, application logic, schemas, workflow states, and tests, while iOPEX engineers retained responsibility for review and production release.

Transcript-Led Survey Understanding

iOPEX designed the pipeline to begin with the customer conversation rather than treating the video as a sequence of unrelated images.

Timestamped speech provides the contextual foundation for identifying rooms, possessions, and customer intent. iOPEX then aligns relevant visual frames with those time ranges to strengthen the evidence supporting each inventory item.

This transcript-first approach allows the workflow to maintain the context of the walkthrough as the customer moves through the property.

Evidence-Grounded Inventory Generation

iOPEX engineered the workflow to produce **structured, room-first inventory data** rather than a simple list of detected objects.

Each generated output can include:

- Inventory items organized by room
- Packed or grouped belongings
- Items requiring further human review.
- Supporting audio or visual evidence
- Special-handling indicators, and

This gives downstream users structured information while preserving the evidence needed to verify how the inventory was produced.

Deterministic Controls for AI Reliability

To strengthen the dependability of automated inventory generation, iOPEX introduced engineering controls around the AI workflow.

Timestamp Bounding

iOPEX implemented controls that prevent evidence timestamps from extending beyond the duration of the source video.

Merge and Deduplication Logic

Deterministic rules reconcile observations across nearby frames and transcript segments to reduce duplicate inventory entries as the camera moves around the property.

Evidence Freeze Policy

Once evidence has been validated and attached to an item, controls protect it from being unintentionally rewritten during subsequent processing stages.

Structured Workflow States

Schemas and code-enforced states govern how inventory progresses through the pipeline rather than allowing unconstrained AI output to determine workflow behavior.

Human Review for Ambiguity

Low-confidence and visual-only observations are routed into a review queue instead of being silently accepted as confirmed inventory.

Claude Code Across the Engineering Lifecycle

Claude Code strengthened iOPEX's ability to develop and refine these interconnected controls across the application and processing stack.

iOPEX engineers used Claude Code to:

- Reason across the multi-stage survey-processing workflow
- Trace defects across transcription, evidence, and inventory states
- Support test development and regression analysis and
- Implement and refactor pipeline logic
- Strengthen deduplication and timestamp-handling logic
- Document technical changes for engineering review.

Every Claude Code-assisted change remained subject to iOPEX engineer review and regression testing before production release.

The production environment uses asynchronous Google Cloud Run services and secure cloud storage, including signed direct-to-cloud video uploads to support scalable processing of customer survey content.

The Result

iOPEX transformed BundleBox's remote survey process from unstructured walkthrough footage into a structured and reviewable source of move-planning data.

Walkthrough Video Converted into Structured Inventory

A **10–20 minute customer walkthrough can now be processed into room-first inventory JSON**, complete with item-level evidence, packed groups, special-handling indicators, and a defined review queue.

Instead of requiring the video to remain the primary source from which inventory must be interpreted, iOPEX created a structured output that can feed subsequent survey, planning, and quotation workflows.

Evidence Integrity Strengthened

iOPEX resolved the observed evidence-timeline issue through timestamp bounding and evidence-freeze controls.

In the identified failure scenario, evidence had extended to approximately **26 minutes for a roughly 17-minute source video**. Following the engineering changes, evidence in that workflow is constrained to the actual duration of the source video.

This provides an important control for ensuring that generated inventory remains traceable to the survey from which it originated.

Duplicate and Context Errors Addressed Systematically

By combining transcript-first segmentation with deterministic merge and deduplication logic, iOPEX created a repeatable method for reconciling observations as customers and cameras move through different rooms.

The workflow is designed to preserve room context while reducing repeated inventory entries from overlapping audio and visual observations.

Uncertain Items Kept Under Human Control

iOPEX designed the solution so automation does not convert uncertainty into false confidence.

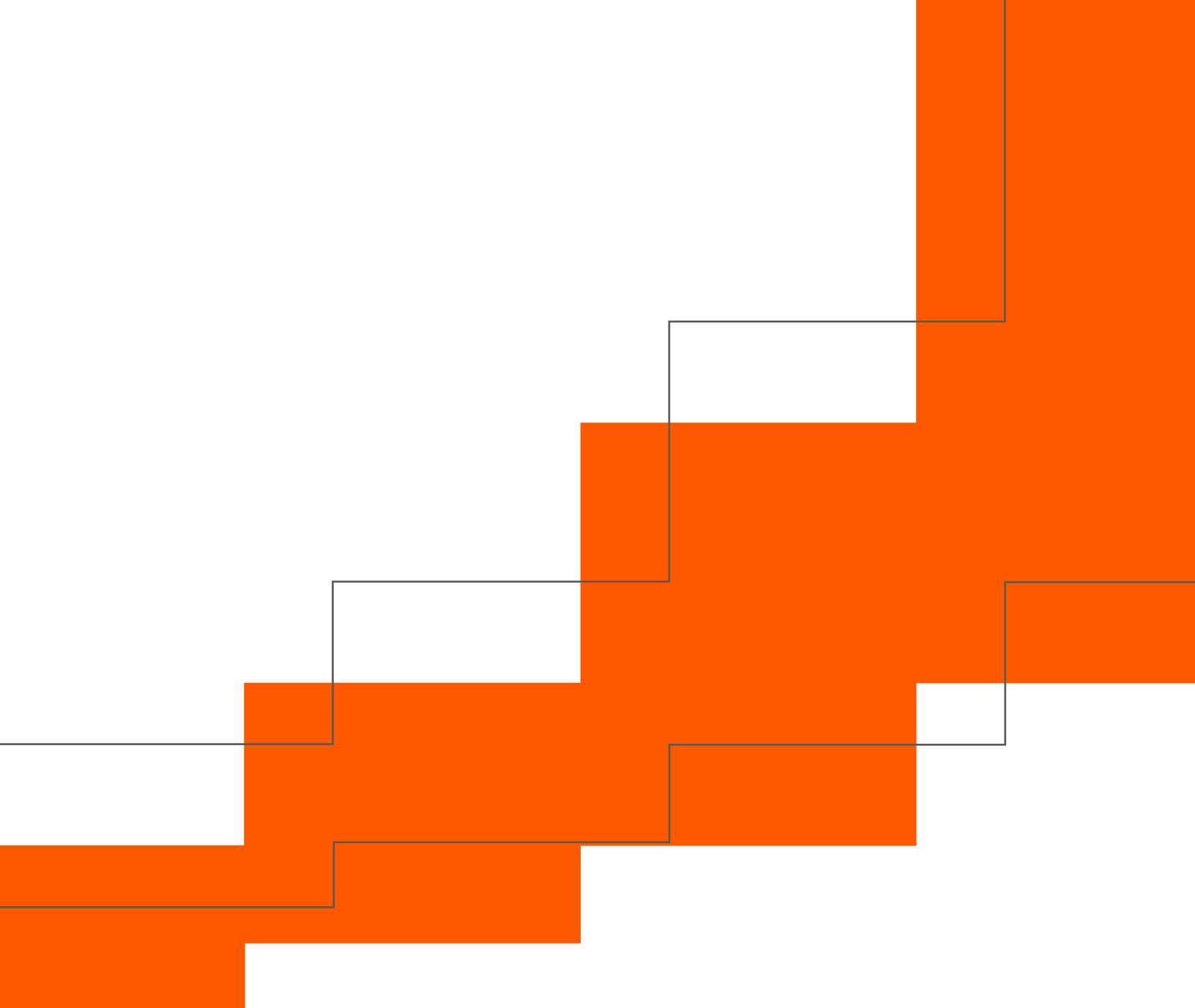
Low-confidence and visual-only observations are routed for review rather than automatically becoming confirmed inventory items. This allows BundleBox to automate high-confidence processing while preserving human judgment where source evidence is insufficient.

A Verifiable Foundation for Survey Automation

Beyond automating inventory creation, iOPEX established a validation framework around the AI survey workflow.

Representative survey videos can be evaluated through transcript and timestamp checks, deduplication testing, item-level evidence review, inventory and volume variance assessment, and regression testing.

This gives BundleBox a stronger foundation for extending AI-driven survey automation while keeping accuracy, traceability, and human oversight central to the workflow.



About iOPEX

iOPEX Technologies is a new-generation agentic AI and automation-led enterprise transformation partner headquartered in San Jose, California. At the intersection of enterprise operations, agentic AI, and intelligent automation, we deliver Intelligence as a Service. Over 70 global brands trust iOPEX as a strategic partner to turn AI into results that scale. We help clients accelerate enterprise transformation without endless consulting cycles by embedding intelligence directly into workflows. Contact us at www.iopeex.com.

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