👣 **User Journey – Advanced AI Estimator for Fire & Security Systems**

This document outlines the step-by-step user journey of an Estimation Engineer or Project Manager interacting with a next-generation AI-powered Estimation Agent. Designed for Cursor-based development, it includes detailed UX logic, agent orchestration, and AI-assisted capabilities.

🎯 **Persona**

* **User Role**: Estimation Engineer / Project Manager
* **Organization**: Fire & Security Systems Integrator (Small to Mid-size)
* **Objective**: Generate accurate, fast, and compliant cost proposals with minimal manual work

🧭 **Stage 1: Discovery & Onboarding**

**1.1 Access**

* User lands on the app via invite link or homepage (e.g., firequote.ai/login).
* Landing screen includes AI demo carousel, feature overview, and CTA: "Start Estimating."

**1.2 Authentication**

* User can sign up via email, Google OAuth, or company SSO.
* Post-login, agent tailors dashboard based on prior usage (e.g., number of projects, template preferences).

**1.3 Branding Setup**

* Agent prompts the user to upload logo and company name.
* Preferences are saved to auto-populate in future proposals.

**1.4 Agent Introduction**

* The agent introduces its core capabilities using a chat-based primer or video explainer: multimodal document parsing, automated BOM, proposal generation, code compliance detection.

📥 **Stage 2: Submit Project Requirements**

**2.1 Start Estimation Wizard**

* User clicks "New Estimation."
* Wizard UI begins with project name, location, and RFP deadline.

**2.2 Upload Input Files**

* Upload section supports:
  + PDFs (RFP, Scope of Work, architectural drawings)
  + ZIPs (blueprints)
  + DOCX (bid instructions)
* Agent uses OCR + NLP + visual model to extract key project metadata (building type, size, floors, zones).

**2.3 Smart Form Auto-Fill**

* Form fields include: building usage, square footage, occupancy type, risk level.
* Agent auto-fills based on uploaded documents and highlights missing fields.
* Offers clarifying suggestions via in-form assistant ("Do you mean a high-rise or mid-rise structure?").

**2.4 Live Agent Q&A (Optional)**

* User can ask questions like: "What’s the typical detector density for a warehouse?"
* AI answers based on NFPA/IBC code and learned parameters.

🧠 **Stage 3: Estimate Generation**

**3.1 Run Estimation**

* After submission, agent triggers a multi-step backend process:
  + Counts devices per zone and per floor based on layout
  + Maps against NFPA code thresholds
  + Calculates labor hours, permits, overhead, regional labor multipliers

**3.2 Review Bill of Materials (BOM)**

* User sees structured output:
  + Device type → Quantity → Unit Cost → Labor → Total
  + Editable columns: quantity override, margin multiplier, part swap (via dropdown)
* Inline warnings for outdated components or cost anomalies.

**3.3 Compliance Verification**

* Agent checks against compliance engine:
  + Flags: "No horn/strobe in stairwell" or "Detector spacing too wide."
  + Pop-ups include: reference to NFPA clause and recommendation

**3.4 Version Log**

* Each run is logged with agent’s decisions and timestamps for traceability.

📄 **Stage 4: Proposal Generation & Delivery**

**4.1 Generate Proposal**

* One-click PDF generator with the following sections:
  + Cover Page (with logo)
  + Executive Summary
  + Scope of Work
  + Bill of Materials
  + Cost Summary
  + Compliance Highlights
  + Terms & Conditions

**4.2 Multi-Channel Delivery**

* Proposal can be:
  + Downloaded as PDF
  + Sent via SMTP email (SES integration)
  + Shared over WhatsApp/SMS (via Twilio)
  + Scheduled for follow-up via Google Calendar API

**4.3 Storage & Status Tracker**

* Proposal appears in dashboard:
  + Status states: Draft → Ready → Sent → Viewed → Won/Lost
  + Filter and search by client, date, building type

📊 **Stage 5: Project Management & Revisions**

**5.1 Estimation History**

* Dashboard of all estimations:
  + Timeline view, cost analytics, RFP sources
  + Client contact info linked

**5.2 Deep Project View**

* Expanded detail:
  + Zone-wise BOM
  + Floorplan overlays
  + NFPA flags and links

**5.3 Re-Estimate on Change Trigger**

* Triggered by:
  + Vendor catalog update
  + Change order submission
* Agent runs diff analysis and re-prices the proposal.

✅ **Stage 6: Human-in-the-Loop Quality Assurance**

**Trigger Conditions**

* Project > $50K
* Non-standard part match
* Low model confidence (< 70%)

**Agent Behavior**

* Escalates estimate to internal estimator
* Email alert sent + dashboard flag: "Review Needed"
* Manual override logged and used to retrain model

🎉 **Outcome Metrics**

| **Metric** | **Before (Manual)** | **After (AI Estimator)** |
| --- | --- | --- |
| Estimation Time | 4–14 days | < 10 minutes |
| Proposal Throughput | 3–5/week | 15–25/week |
| Compliance Accuracy | 75–80% | 95%+ |
| Human Rework Required | Frequent | < 10% |
| Training Required | Days | < 1 hour |