



PRECISION SOURCING FOR PRECISION ENGINEERING

AI-powered BOM optimization with real-time DigiKey inventory data.
Find parts, compare prices, and source with confidence.

4

AI AGENTS

3

SUPPLIER APIS

30h

BUILD TIME

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LIVE SUPPLIER DATA

Direct API integration with DigiKey means you're always seeing live data. No cached results from yesterday. No stale pricing.

- Live stock levels updated every request
- Price breaks at every quantity tier
- Lead time visibility for backordered items
- Factory stock vs distributor stock breakdown

API_RESPONSE // DigiKey Live

```
{
  "mpn": "STM32F405RGT6",
  "manufacturer": "STMicroelectronics",
  "stock": {
    "digikey": 4847,
    "factory": 12000
  },
  "pricing": [
    { "qty": 1, "unit": 11.42 },
    { "qty": 10, "unit": 10.28 },
    { "qty": 100, "unit": 8.85 }
  ],
  "leadTime": "In Stock"
}
```

INTELLIGENT ANALYSIS

Our AI doesn't just find exact matches. It analyzes your BOM and suggests alternatives based on availability, pricing tiers, and specifications.

- Alternate parts with equivalent specs
- Quantity optimization for price breaks
- Vendor consolidation recommendations
- Risk flags for sole-source or EOL parts
- Transparent reasoning for every suggestion

AI_REASONING // Claude Analysis

[COST_OPTIMIZATION]

Increasing order quantity from 50 to 100 units drops unit price from \$2.34 to \$1.87 — 20% savings for 2x volume.

[RISK_ALERT]

Single-source part with 6-week lead time. Consider TI equivalent TPS63020DSJR available from 3 distributors.

REAL-WORLD DATA

Real-world supply chain data that APIs don't capture. Our Market Intel agent scrapes news, manufacturer announcements, and trade publications via Apify.

- Component shortage alerts from industry news
- Manufacturer EOL and PCN announcements
- Price trend analysis from trade publications
- Supply chain risk signals in real-time
- Powered by Apify web scraping platform

MARKET_INTEL // Apify Scraping

[SHORTAGE_ALERT]

STM32F4 series experiencing 18-week lead times due to fab capacity constraints.

[EOL_WARNING]

TI announces LM317 EOL Q3 2026. Last-time-buy deadline: March 2026.

[PRICE_TREND]

MLCC prices down 12% QoQ. Good time to stock up on 0402/0603 caps.

SMART PARSING

Every team exports BOMs differently. Different column names, different formats. We handle it. Upload your CSV or Excel and we'll figure out what's what.

- Automatic column detection (MPN, quantity, etc.)
- Handles multiple MPN formats and conventions
- Fuzzy matching for partial part numbers
- Description-based search when MPN fails
- CSV, XLSX, and ODS support

COLUMN_DETECT // Auto-mapping

INPUT:

Part #	Desc	Qty	Ref Des
--------	------	-----	---------

Part # → MPN ✓

Desc → DESCRIPTION

Qty → QUANTITY ✓

Ref Des → REFERENCE

[✓] Detected 47 line items

[✓] 45 parts matched

[!] 2 parts need review

SEAMLESS WORKFLOW

Once you've optimized your BOM, get it out of the tool and into your workflow. Export to CSV or use our direct DigiKey cart integration.

- Export to CSV with full decision audit trail
- Direct add-to-cart for DigiKey
- Include AI reasoning in exports
- Custom export templates (coming soon)
- API access for automation (coming soon)

[1] EXPORT CSV

Full BOM with pricing



[2] ADD TO DIGIKEY

Direct cart integration



DIRECT API CONNECTIONS

Direct API connections to the distributors you use.

DIGIKEY

[ACTIVE]

MOUSER

[SOON]

ARROW

[SOON]

NEWARK

[SOON]

LCSC

[SOON]

DATA SOURCES

APIFY

[MARKET INTEL]

SOURCING MANAGEMENT

Tools to manage your sourcing workflow.

SAVED BOMS

Store and version your bills of materials. Quick access to recent projects.

● AVAILABLE

HISTORY

Track every search, every decision. Full audit trail for compliance.

● AVAILABLE

TEAM COLLAB

Share BOMs with team members. Comment on part selections.

○ COMING SOON

FOUR SPECIALIZED AGENTS

Each with a unique perspective, running in parallel.

[00] MARKET INTEL

APIFY

Scrapes news, manufacturer sites, and trade publications.

- Shortage alerts
- EOL announcements
- Price trends

[01] ENGINEERING

Validates parts against compliance requirements.

- RoHS/REACH
- Lifecycle (EOL?)
- Counterfeit risk

[02] SOURCING

Evaluates supply chain risk, checks stock levels.

- Lead time analysis
- Multi-source options
- Supplier trust scores

[03] FINANCE

Optimizes for budget constraints and cost savings.

- Price break analysis
- MOQ optimization
- Volume discounts

All 4 agents run in parallel using `asyncio.gather()` → Final Decision Agent synthesizes results

INTERNALS v1.0 // SYSTEM ARCHITECTURE

UNDER THE HOOD MULTI-AGENT ARCHITECTURE

Four specialized AI agents working in parallel. Real-time supplier APIs.
Live market intelligence via Apify. Blockchain audit trails.

4

AGENTS

Yes

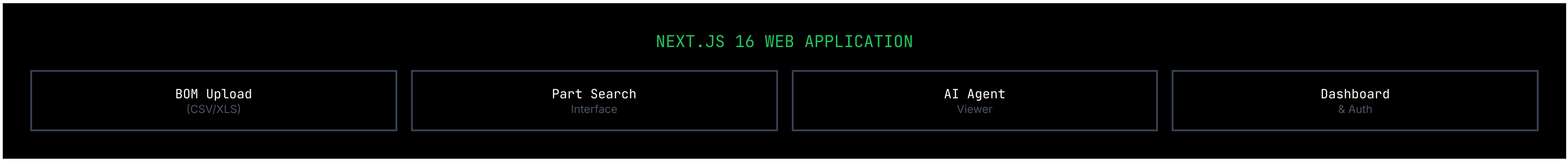
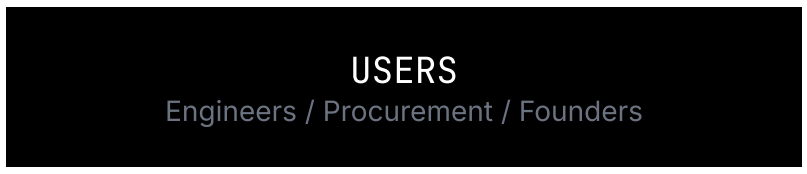
PARALLEL EXEC

3

SUPPLIER APIS

30h

BUILD TIME





[00] MARKET INTEL

APIFY

REAL-WORLD DATA

- ✓ Shortage Alerts
- ✓ Price Trends
- ✓ Mfr News
- ✓ EOL Announce
- ✓ Supply Signals
- ✓ Trade News

Scrapes news via Apify for real-world intel.

[01] ENGINEERING

COMPLIANCE CHECK

- ✓ RoHS 3 Status
- ✓ REACH SVHC
- ✓ IEC 60601-1
- ✓ IPC Class (1-3)
- ✓ Lifecycle (EOL?)
- ✓ Counterfeit Risk

Validates against compliance databases.

[02] SOURCING

SUPPLY CHAIN RISK

- ✓ Lead Time Check
- ✓ Stock Levels
- ✓ Supplier Trust
- ✓ Multi-Source OK?
- ✓ Market Intel
- ✓ Alt Parts Avail

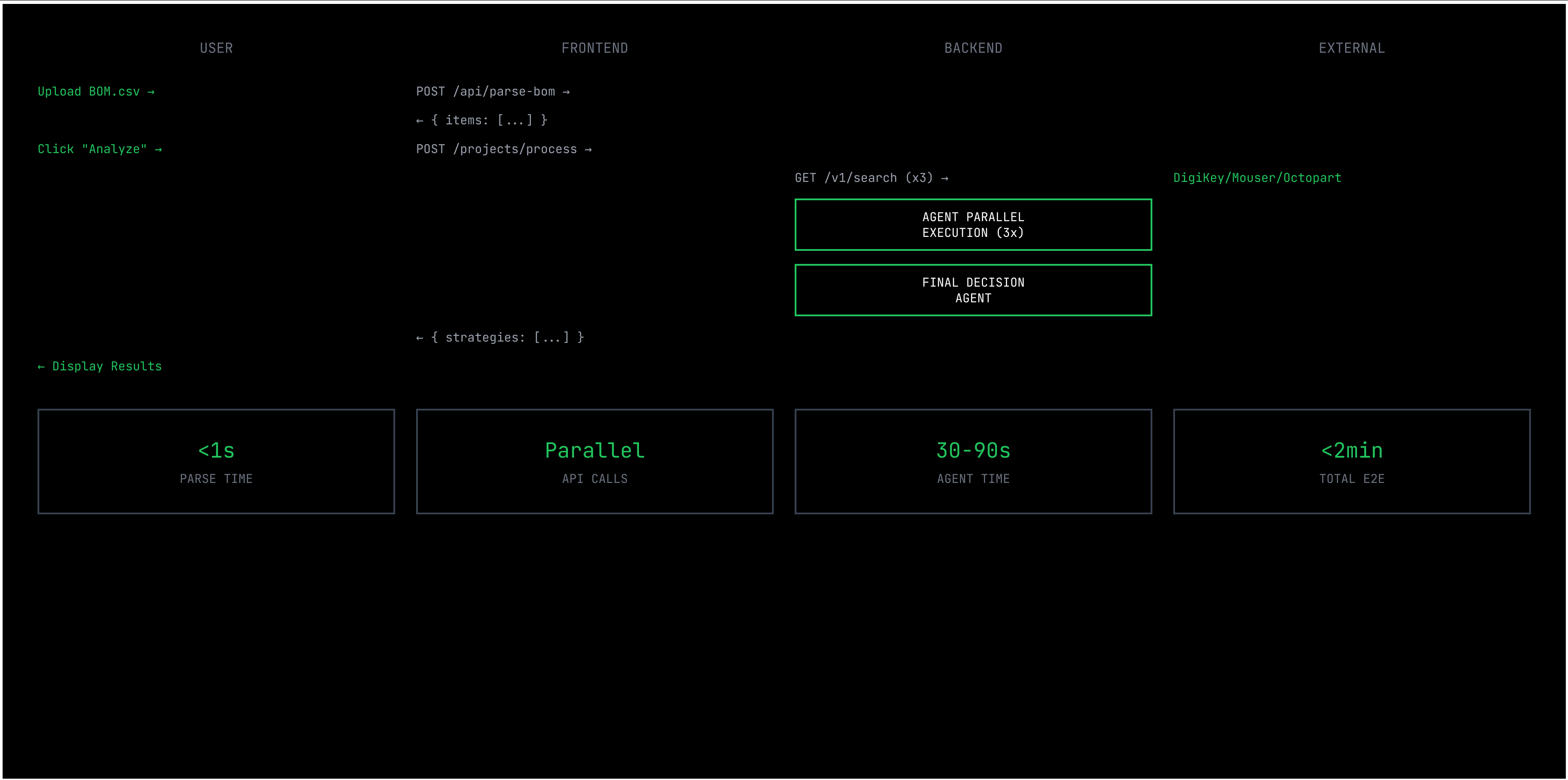
Evaluates risk with market intel.

[03] FINANCE

BUDGET ANALYSIS

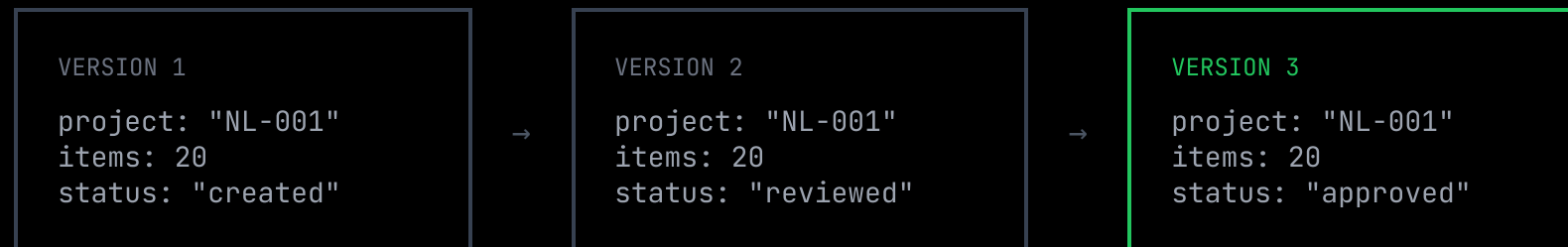
- ✓ Unit Cost
- ✓ Extended Cost
- ✓ MOQ Requirements
- ✓ Price Breaks
- ✓ Budget Remaining
- ✓ Volume Discounts

Optimizes for budget constraints.



IMMUTABLE JSON STATE

ETHEREUM BLOCKCHAIN



- Full JSON state stored on-chain
- Every version is immutable
- Authorized signer required for writes
- Complete history for FDA/ISO audits

WHY BLOCKCHAIN?

- Medical devices need FDA-auditable trails
- Aerospace needs AS9100 compliance records
- Can't modify or delete historical decisions
- Timestamp proof of when decisions were made

ERC-7827
STANDARD

Ethereum
NETWORK

Append
MUTABILITY

Forever
HISTORY

TECH STACK // THE FULL PICTURE

<div>Next.js 16</div> <div>Frontend</div>	<div>React 18</div> <div>UI Library</div>	<div>Tailwind</div> <div>Styling</div>	<div>TypeScript</div> <div>Language</div>
<div>FastAPI</div> <div>Backend</div>	<div>Python 3.12</div> <div>Runtime</div>	<div>CrewAI</div> <div>Agents</div>	<div>OpenAI GPT</div> <div>LLM</div>
<div>Apify</div> <div>Web Scraping</div>	<div>Pydantic</div> <div>Validation</div>	<div>Neon</div> <div>Database</div>	<div>Ethereum</div> <div>Blockchain</div>

BUILD STATS // HACKATHON EDITION

30

HOURS TO BUILD

45

TESTS PASSING

3

SUPPLIER APIS

5

AI AGENTS

• CLINE

AI-POWERED CODE GENERATION

Cline helped us write production-quality TypeScript, Python, and Solidity across 4 separate deployments. Full-stack in a weekend.

- Next.js Frontend
- Python Agent Service
- Neon Postgres
- Ethereum Contracts

17,149

LINES OF CODE

4 Deployments
Built in 30 Hours

• OPENAI + CREWAI

AGENT FRAMEWORK

CrewAI provides excellent agent orchestration, but swapping to OpenAI GPT-5.2 for inference gave us 3.75x speed improvement.

- CrewAI for orchestration
- OpenAI GPT-5.2 for inference
- Best of both worlds

SPEED COMPARISON

CrewAI Default: ~45s/agent

GPT-5.2: ~12s/agent

3.75x

FASTER

• RILO

LEAD ACQUISITION AUTOMATION

We used Rilo to generate LinkedIn and Reddit content for PrecisionBOM.

`getrilo.ai`

- Email signup workflows
- LinkedIn outreach automation
- Lead enrichment pipeline
- Plain English → Workflows

"Get me signups from hardware engineers interested in BOM optimization"



AUTOMATED IN MINUTES

• AI NATIVE STUDIO

NEXT-GEN DEV ENVIRONMENT

AI Native Studio helped with rapid prototyping and code quality checks during our speed-focused hackathon development.

`ainative.studio`

- Code quality analysis
- AI-assisted debugging
- Architecture exploration

RAPID
PROTOTYPING
&
QUALITY

• APIFY

LIVE: MARKET INTELLIGENCE AGENT

apify.com - Web Scraping at Scale

APIFY ACTORS

- Web Scraper
- News Scraper
- Site Crawler

MARKET INTEL AGENT

- Component shortage alerts
- Manufacturer news & updates
- Price trend analysis
- EOL/lifecycle announcements
- Supply chain risk signals

INTEGRATION: BOM Upload → Extract MPNs → Apify scrapes news/manufacturer pages → MarketIntelAgent analyzes → Risk alerts

13,000+ pre-built scrapers Real-time data Proxy rotation



ESI x Korea Investments AI Agent Hackathon 2026

WANT TO SEE IT IN ACTION?

Upload a BOM and watch the agents work.

TRY IT NOW →

VIEW FEATURES

precisionbom.com

Built for the ESI x Korea Investments AI Agent Hackathon 2026
Team: Ojas Patkar • Jacob Valdez • Mark Lubin • Kyle Smith