

Assignment 1

Phase 4

PRD

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Product Requirements Document

Installation Difficulty Badge System for AutoZone Mobile App

Summary

The Opportunity

67% of AutoZone app users abandon their shopping carts, with 46% citing "uncertainty about installation complexity" as the primary reason. This represents a loss of approximately \$150M+ in annual revenue from abandoned purchases alone.

The Solution

Implement an Installation Difficulty Badge System that displays clear visual indicators of DIY complexity, time estimates, and tool requirements on every automotive part listing. This empowers users to make confident purchase decisions by understanding upfront whether they can successfully install a part themselves.

Expected Impact

- Reduce cart abandonment from 67% to 45% (-22 percentage points)
- Increase conversion rate from 12% to 18% (+6 percentage points)
- Improve app rating from 3.2 to 4.0+ stars
- Projected revenue impact: \$85M+ annually from improved conversion

Why Now?

- Installation anxiety is the #1 barrier to purchase across all user segments
- Competitors (O'Reilly, Advance Auto) lack similar guidance features
- Low technical complexity with high user impact (RICE score: 27.0)
- Aligns with AutoZone's mission: "help every customer feel confident tackling their vehicles"

Problem Statement

Current State

Users searching for automotive parts on the AutoZone app face significant decision paralysis when trying to determine if they can successfully install a part themselves. The current product experience provides:

- Part specifications and compatibility information
- Pricing and availability

- Generic product descriptions

What's Missing:

- No indication of installation difficulty
- No time estimates for completion
- No tool/equipment requirements listed
- No skill level guidance

User Pain Points (Research-Backed)

From Survey Data (n=24):

- 46% abandon cart due to installation uncertainty
- 67% abandon due to compatibility fears (related to installation confidence)
- 42% ranked "installation difficulty ratings" as most valuable improvement

From App Store Reviews:

- Recurring themes: "Which one can I install myself?", "Too complicated", "Ended up calling a mechanic"

Impact on Business

- Cart abandonment rate: 67% (vs. 45% industry average)
- Low app store rating: 3.2/5 stars (competitors averaging 4.0+)
- Customer service burden: High call volume for installation questions
- Lost revenue: Users choosing full-service competitors over DIY

Goals & Success Metrics

Business Goal

Increase AutoZone app conversion rate from 12% to 18% within 6 months by reducing installation-related cart abandonment.

Product Goals

1. Reduce cognitive load during product evaluation
2. Build user confidence in DIY capability
3. Set accurate expectations for time and skill required
4. Decrease customer service inquiries about installation

Success Metrics

Part A: Key Metrics Framework

Metric Type	Metric Name	Definition	Why It Matters	Target
Key Metric	Purchase Conversion Rate	% of users who complete purchase after viewing product with difficulty badge	Directly measures if installation clarity drives purchasing decisions	12% → 18% (+6 pts)
Secondary Metric	Cart Abandonment Rate	% of users who add items to cart but don't complete purchase	Shows if badge reduces pre-purchase anxiety	67% → 45% (-22 pts)
Secondary Metric	Product Page Engagement Time	Average time spent on product pages with badges	Indicates users are reading and understanding badge information	+15-20% increase
Secondary Metric	"Complete the Job" Bundle Attach Rate	% of users who add suggested complementary items	Measures confidence in attempting DIY installation	0% → 25%
Guardrail Metric	Return Rate (Installation-Related)	% of purchased parts returned due to "couldn't install" reasons	Ensures badges don't oversimplify complex installations	≤ 8% (current baseline)
Guardrail Metric	Customer Service Contact Rate	# of CS contacts about installation per 1000 app orders	Ensures badge provides sufficient clarity	-30% reduction
Guardrail Metric	App Store Rating	Average rating on iOS/Android stores	Overall user satisfaction indicator	3.2 → 4.0+

Measurement Plan

- Pre-Launch Baseline: 2 weeks of current-state metrics
- A/B Test: 50/50 split with control group for 4 weeks
- Weekly Reviews: Monitor key metrics and guardrails
- Full Rollout: After validation of 4%+ conversion lift

Solution Overview

The Installation Difficulty Badge System

A three-tier visual classification system that appears on every automotive part listing, providing instant clarity about DIY feasibility.

Badge Levels

1. DIY FRIENDLY (Green Badge)

- Time Range: 10-30 minutes
- Skill Level: Beginner
- Examples: Air filters, wiper blades, batteries, light bulbs, cabin filters
- Typical Tools: Basic hand tools or no tools required
- User Message: "Quick & Easy - Perfect for Beginners"

2. INTERMEDIATE (Blue Badge)

- Time Range: 45 minutes - 2 hours
- Skill Level: Some mechanical experience helpful
- Examples: Brake pads, alternator, spark plugs, thermostats
- Typical Tools: Socket set, jack, jack stands, torque wrench
- User Message: "Moderate Difficulty - Weekend Project"

3. PRO RECOMMENDED (Orange Badge)

- Time Range: 2-4+ hours
- Skill Level: Advanced or professional installation suggested
- Examples: Timing belt, transmission components, AC compressor
- Typical Tools: Specialized tools, lift equipment, diagnostic tools
- User Message: "Complex - Consider Professional Installation"

Information Hierarchy

On Search Results (List View):

- Badge icon + shortened label (e.g., "DIY 20min")
- Visible at a glance without clicking

On Product Detail Page:

- Full badge with expanded information card
- Estimated time range
- Required tools list
- Skill level description
- Link to installation video (if available)
- "Complete the Job" bundle suggestions

Tooltip/Expandable Info:

- What makes this task this difficulty level
- Common pitfalls to avoid
- When to consider professional help

User Stories

Priority 1 (Must Have)

As Emergency AAA (beginner user in urgent situation),

- I want to immediately see if I can install a part myself
- So that I can decide whether to attempt DIY or call a mechanic
- Acceptance Criteria: Badge visible on all product listings within 3 seconds of page load

As DIY BBB (experienced enthusiast),

- I want to see time estimates and tool requirements upfront
- So that I can plan my project and gather necessary equipment
- Acceptance Criteria: Expandable detail card shows complete tool list and time range

As Cost-Conscious CCC (occasional maintainer),

- I want clear guidance on what's safe for me to attempt
- So that I don't waste money on parts I can't install
- Acceptance Criteria: Beginner-friendly language explains skill level needed

Priority 2 (Should Have)

As a user browsing multiple options,

- I want to filter search results by installation difficulty
- So that I only see parts matching my skill level
- Acceptance Criteria: "Filter by DIY Level" option in search filters

As a user who's never changed brakes before,

- I want to see a video showing the installation process
- So that I can assess if I'm comfortable attempting it
- Acceptance Criteria: Link to installation video on product page when available

Priority 3 (Nice to Have)

As a repeat customer,

- I want the app to remember my skill level preference
- So that I see relevant difficulty badges for my experience
- Acceptance Criteria: Personalized badge messaging based on purchase history

Functional Requirements

FR-1: Badge Display System

FR-1.1: Every product listing must display exactly one difficulty badge

- Badge determined by product category + part complexity algorithm
- Default to most conservative (higher difficulty) when uncertain

FR-1.2: Badge visibility requirements:

- Search results: Icon + compact label
- Product detail: Full badge with expandable details
- Cart: Badge summary visible
- Mobile and desktop: Responsive design

FR-2: Badge Detail Card (Expandable)

FR-2.1: Tapping/clicking badge opens detail modal with:

- Full difficulty explanation
- Estimated time range
- Required tools (with checkboxes for user planning)
- Skill level description
- Safety warnings if applicable
- Installation video link (if available)
- "Complete the Job" bundle suggestions

FR-2.2: Detail card must be accessible without leaving product page

FR-3: Filtering & Search

FR-3.1: Add "Installation Difficulty" filter to search refinement options

- Allow multi-select: "Show only DIY Friendly & Intermediate"
- Persist filter preference for session

FR-3.2: Search results count updates dynamically with filter applied

FR-4: "Complete the Job" Bundling (Secondary Feature)

FR-4.1: When user views INTERMEDIATE or PRO parts, suggest commonly needed complementary items:

- Example: Brake pads → suggest brake cleaner, brake fluid, anti-squeal paste
- One-click "Add All to Cart" option

FR-4.2: Bundle suggestions based on:

- Product category relationships
- Purchase history data (what others bought together)
- Professional mechanic recommendations

FR-5: Analytics & Tracking

FR-5.1: Track user interactions:

- Badge views
- Detail card expansions
- Filter usage
- Conversion by difficulty level
- Cart abandonment correlation

FR-5.2: A/B test capability:

- Control group sees products without badges
- Test group sees full badge system
- 50/50 split for 4 weeks

Design Requirements

Visual Design Principles

1. Scannable: Badge visible in < 1 second of page load
2. Clear Hierarchy: Color-coded system (Green/Blue/Orange) with universal understanding
3. Accessible: WCAG 2.1 AA compliant (contrast ratios, screen reader support)
4. Non-intrusive: Enhances existing design without cluttering interface

Design Assets Needed

- Badge icon set (3 variations × 3 sizes)
- Detail card modal design
- Filter UI component
- Empty states (if no video available, etc.)
- Mobile + desktop responsive layouts

Reference Wireframes

See Phase 3 wireframes for detailed screen flows:

- Search results with badges
- Product detail with expandable card
- Filter interface
- Bundle suggestions in cart

Technical Considerations

Data Requirements

Badge Classification Database:

- Initial seeding: Manual classification of top 1,000 most-purchased SKUs
- Ongoing: Algorithm-assisted classification for new products
- Data sources:
 - Product category mapping
 - Installation time studies
 - Professional mechanic input
 - User-generated time logs (post-launch)

Required Tool Database:

- Map tools to product categories
- Maintain tool name standardization
- Link to AutoZone tool rental/purchase options

Performance Requirements

- Badge data cached with product info (no additional API call)
- Page load impact: < 50ms additional
- Image assets: < 10KB total per badge set

Platform Support

- iOS App: iOS 15+
- Android App: Android 10+
- Web Mobile: Responsive design
- Desktop Web: (Phase 2 consideration)

Launch Plan

Phase 1: Pilot (Weeks 1-2)

- Scope: Top 500 most-purchased SKUs
- Traffic: 10% of app users (A/B test)
- Focus: Data validation, performance monitoring
- Success Gate: No degradation in page load, < 5% support ticket increase

Phase 2: A/B Test (Weeks 3-6)

- Scope: All products with classified difficulty data (~80% catalog)
- Traffic: 50% test vs. 50% control
- Focus: Conversion impact measurement
- Success Gate: Statistically significant 3%+ conversion lift

Phase 3: Full Rollout (Week 7+)

- Scope: 100% of users, all classified products
- Traffic: All app users
- Focus: Scale monitoring, ongoing optimization
- Post-launch: Continue badge classification for remaining catalog

Rollback Plan

- Feature flag-controlled: Can disable badges within 5 minutes
- Rollback triggers:
 - App crash rate increase > 2%
 - Page load time increase > 200ms
 - Conversion rate drop > 1%
 - Customer service volume spike > 50%

Part B: Risk Analysis & Mitigation

Critical Assumptions & Failure Modes

Assumption at Risk	Failure Mode	Impact	Likelihood	Mitigation (Practical)	Detection Signal	Containment / Rollback

Badge classifications are accurate	Users attempt installations beyond their skill level, leading to frustration, part damage, or safety issues	High	Medium	- Manual audit by mechanics of first 1,000 classifications - Conservative bias (mark uncertain items as PRO) - User feedback loop: "Was this time estimate accurate?"	- Return rate increase for specific SKUs - CS complaints about "couldn't install" - App reviews mentioning difficulty mismatch	- Immediate badge reclassification - Add warning modal for flagged parts - Disable badge for problematic SKUs pending review
Users will read and understand badges	Users ignore badges and purchase anyway, no behavior change; OR misinterpret meaning and still abandon	Medium	Low	- User testing with 20 participants before launch - Clear visual hierarchy and standard iconography - Onboarding tooltip on first badge encounter - A/B test badge copy variations	- Badge click-through rate < 15% - Detail card expansion rate < 10% - No statistically significant conversion lift in A/B test	- Redesign badge visual treatment - Add animated "New Feature" callout - Test alternative copy/icons - Consider mandatory tutorial
Time estimates are realistic	Users start installation based on "30 min" estimate, but it takes 2 hours, leading to frustration and negative reviews	High	Medium	- Time estimates based on professional mechanic data + 50% buffer for DIYers - Show range (30-45 min) not fixed time - Post-purchase survey: "How long did it take?" - Iterate estimates based on real user data	- Post-install surveys showing actual time 2x+ estimate - App reviews mentioning "took way longer" - Spike in "couldn't complete" returns	- Widen time ranges immediately - Add "First-time DIY may take longer" disclaimer - Update specific SKU estimates - Consider beginner vs. experienced time splits

Video content availability sufficient	Most products lack installation videos, creating inconsistent experience and user disappointment	Low	High	• Launch with "video available" as optional, not required • Partner with existing content (YouTube, AllData) • Curate top 200 SKU videos first • Crowdsource user installation videos (incentivized)	• % of products with video links < 30% • High click rate on "No video available" placeholder • User feedback requesting videos	• De-emphasize video in badge card (move to separate section) • Rapid video creation for top SKUs • Link to written guides as alternative
Bundle suggestions increase AOV without friction	Suggested items feel like upsell spam, irritating users and hurting conversion	Medium	Low	• Limit bundles to truly necessary items (brake fluid for brakes) • "Most customers also need" social proof • Easy dismiss/ignore option • A/B test bundle visibility	• Negative sentiment in feedback • Bundle add-to-cart rate < 5% • Conversion rate lower for products with bundles shown	• Reduce bundle prominence • Show only for INTERMEDIATE+ difficulty • Limit to 2-3 items max • Make fully optional/dismissible

Secondary Risks (Monitor but Lower Priority)

Risk	Impact	Mitigation	Detection
Competitive response (O'Reilly copies feature)	Medium	Speed to market; patent if novel; continuous improvement	Monitor competitor apps monthly
SEO/SEM impact if product pages change significantly	Low	Maintain URL structure; update meta tags; monitor rankings	Weekly SEO dashboard
Increased support burden during learning curve	Medium	Self-service help articles; in-app FAQ; train CS team	Support ticket volume by category

Open Questions & Decisions Needed

For Engineering

- ☐ What's the most efficient way to serve badge data? (cached with product info vs. separate API call)
- ☐ Should we build badge classification algorithm in-house or use ML service?
- ☐ What's the minimum iOS/Android version support?

For Design

- ☐ Should "PRO RECOMMENDED" explicitly mention "professional installation" or soften language?
- ☐ How prominent should bundle suggestions be? (inline vs. modal vs. cart-only)
- ☐ Do we need localization for tools/terminology in international markets?

For Data/Analytics

- ☐ What's our current baseline for installation-related returns? (need CS audit)
- ☐ Can we segment conversion impact by user type (new vs. repeat)?
- ☐ What's the threshold for statistical significance in A/B test?

For Business/Legal

- ☐ Any liability concerns with time estimates or difficulty ratings?
- ☐ Should we include disclaimer about professional installation always being an option?
- ☐ Do we need mechanic certification for badge classifiers?

Success Criteria (Go/No-Go for Full Launch)

Must Achieve (Phase 2 A/B Test)

- Conversion rate improvement: $\geq 3\%$ lift (statistically significant, $p < 0.05$)
- Cart abandonment reduction: ≥ 10 percentage points
- No increase in installation-related returns: $< 8\%$ baseline
- App stability maintained: Crash rate $\leq 0.5\%$
- Performance acceptable: Page load increase $< 100\text{ms}$

Nice to Have

- App store rating improvement: $+0.3$ points
- Customer service contact rate: -20% reduction
- Bundle attach rate: $> 15\%$
- Positive qualitative feedback in app reviews

Launch Decision Framework

- Green Light (Full Rollout): All "Must Achieve" criteria met
- Yellow Light (Iterate & Retest): 3-4 of 5 criteria met, no major failures
- Red Light (Pause/Pivot): < 3 criteria met OR major failure (safety, legal, crash)