

Pattern Library

Pattern Hygiene Rules

1. Identity & Tracking

- **Pattern ID:** sequential number (P01, P02 ...).
- **Version Tag:** v1, v2 (if revised).
- Ensures traceability across research & simulations.
- Outdoor Living, Construction / Modular Housing, Solar / Energy / Renewables, Furniture & Home, HVAC / Appliances, Smart Home / IoT / Tech, Automotive / EV / Mobility, Cross-Industry, Other (AgriTech, Healthcare, Retail, Services, etc.)

2. Definition of a Pattern

- A repeatable dynamic with cause → effect structure.
- Must be backed by ≥2 KPI anchors + evidence.
- Captures why outcomes repeat, not just a scenario.

3. Monte Carlo Requirements

- Simulation Anchors (mandatory):
 - Define KPI distributions (e.g., Conversion 0.15–0.25).
 - Probability Weights: Confidence × Evidence Strength.
 - Outcome Polarity: (+ / – / ± depending on condition).
- Interaction Hooks: ability to cross-link with PESTEL, SWOT, Porters outputs (from Action Layer).
- Sensitivity Tags: highlight which factor shifts (e.g., seasonality, CAC, regulation) move the outcome most.

4. Tagging Rules

- Factor IDs: Always mapped to F1–F28.
- Cross-Segment Tags: Consumer / Brand / Market / Experience / Product.
- Transferability: Local / Regional / Global.

5. Categorization Rules

- By Segment: Consumer, Product, Market, Brand, Experience.
- By Business Model: Cost Leadership, Premium, Ecosystem, Vertical Integration, Franchise, Subscription, etc.
- By Lever Type: Conversion, Retention, ARPU, CAC, Lead Time, ASP, NRR.
- By Industry: so we know if it's pergola-specific, adjacent (furniture, hot tubs), or generic (supply chain, vertical integration).

6. Hygiene Filters (to qualify as Pattern)

- ✓ Pattern ID + Name.
- ✓ ≥ 2 KPI Anchors with ranges.
- ✓ Probability Weights for Monte Carlo.
- ✓ Factor Tagging (F1–F28).
- ✓ Evidence Strength + Confidence Weight.
- ✓ Transferability note.
- ✗ Reject if scenario-only, without measurable anchors.

Pattern Template

- **Pattern ID:** Unique sequential number (e.g., P043)
- **Pattern Name:** Clear, short, descriptive
- **Pattern Type:** Success / Fragility / Adaptation / Opportunity
- **Industry Scope:** One primary industry + optional secondary tags (from taxonomy)
- **Segments Involved:** Consumer / Product / Brand / Experience / Market (multi-select)
- **Factors:** Reference factor numbers (e.g., F11, F15, F21)

- **Trigger / Driver:** The event/condition that initiates the pattern
- **Pre-conditions:** Contextual enablers (infrastructure, culture, climate, regulation, etc.)
- **Strategic Response:** What companies do to exploit or mitigate
- **Outcome Measure(s):** Primary KPIs used (conversion, ARPU, retention, NPS, etc.)
- **Outcome Polarity:** Positive (+) / Negative (–)
- **Transferability:** High / Medium / Low — with notes

- **Leading Indicators:** Early signals this pattern is activating
- **Lagging Indicators:** Later signals confirming success/failure

- **MC Levers:** Which business levers it shifts (CAC ↓, Retention ↑, ARPU ↑, etc.)
- **Effect Size Hints:** Quantitative ranges (e.g., +5–10 pts adoption, –20% CAC)
- **Evidence Strength:** Scale (0.4–0.9) — based on sources & data quality

- **Confidence:** Derived from Evidence × Recency × Similarity
 - **Probability Range (for Monte Carlo):** Expected probability of success/failure in % or range (e.g., 0.55–0.75)
 - **Variance / Sensitivity:** What variables cause outcomes to swing most (e.g., climate, regulation, price elasticity)
 - **Provenance:** Sources, citations, reports
 - **Notes:** Quotes, qualitative insights, anomalies
 - **Cross-Tags:** Other segments/factors it links to
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Pattern ID: P001

Pattern Name: Seasonal Install Compression

Pattern Type: Adaptation

Industry Scope (Primary): Outdoor Living (Pergolas)

Segments Involved: Consumer, Experience

Factors (F#): F11, F12, F15 (+ Market risk F26 context)

Trigger / Driver: Peak spring demand + short summer window; only **18%** CZ intent→install within 12 months despite **78%** access.

Pre-conditions: Visible installer capacity; small-structure “no/fast-permit” path available; ability to offer time-boxed slots and financing.

Strategic Response: “Summer-ready in 30 days” slot blocks; **72-hour** pre-site check; online slot-picker; 0% seasonal financing.

Outcome Measure(s): ≤30/60/90-day install rate; median lead time (days).

Outcome Polarity: + (with response; baseline friction is –).

Transferability: High across seasonal outdoor categories.

Leading Indicators: Booking lead time, slot-accept rate, deposit conversion.

Lagging Indicators: ≤60-day installs, cancellations, seasonal usage frequency.

MC Levers: Conversion rate ↑; Lead time ↓; CAC ↓; Revenue velocity ↑.

Effect Size Hints (priors): Install $\leq 12m$ +10–12 pp; median lead time –25–35%.

KPI Anchors (dists):

- Install_within_60d_pp → **Triangular(6, 9, 12)** pp → maps_to: Conversion, Velocity
- Lead_time_change_pct → **Normal(–30%, 8%)**, bounds [–60%, 0%] → maps_to: LeadTime, Capacity
- Booking_to_deposit_pp → **Triangular(5, 8, 10)** pp → maps_to: Conversion, CAC

Correlations: lead_time_change_pct ↔ install_within_60d_pp $\rho = -0.6$.

Probability Range: 0.64–0.80 (base = Confidence 0.72 ± 0.08).

Variance / Sensitivity: Installer capacity; permit friction; weather shocks.

Evidence Strength: 0.75

Confidence: 0.72

Provenance: ČSÚ Home Improvement 2024; Ipsos CZ Outdoors 2025; MPO Distribution 2024.

Notes: “Once we decided, we had it up in three months.”

Pattern ID: P002

Pattern Name: Neighbor Flywheel Activation

Pattern Type: Success

Industry Scope (Primary): Outdoor Living (Pergolas)

Segments Involved: Consumer, Brand

Factors (F#): F13, F15, F18

Trigger / Driver: CZ social influence **34%** vs EU/US higher; cluster installs under-leveraged.

Pre-conditions: Install clusters ($>10/km^2$); simple proof-sharing (yard plaques/QR); referral ops set-up.

Strategic Response: Double-sided referral; **3–5 km** “open-yard” demos; QR plaques; UGC 15-sec video rewards.

Outcome Measure(s): Referral share of orders; NPS; repeat accessory purchase.

Outcome Polarity: +

Transferability: High in suburban/low-rise geos.

Leading Indicators: QR scans, RSVP/attendance, referral code activations.

Lagging Indicators: Referral order %, NPS, 6–12m repeat.

MC Levers: CAC ↓; Conversion ↑; Retention ↑.

Effect Size Hints (priors): Referral share **+10–15 pp**; NPS **+8–10 pts**.

KPI Anchors (dists):

- Referral_order_share_pp → **Triangular(8, 12, 15)** → maps_to: CAC, Conversion
- NPS_change_pts → **Normal(+9, 2)**, bounds [+5, +15] → maps_to: Loyalty, Retention

Correlations: referral_share ↔ NPS_change **$\rho=+0.5$** .

Probability Range: **0.58–0.75** (Confidence 0.68 ± 0.10).

Variance / Sensitivity: Cluster density; incentive strength; HOA rules.

Evidence Strength: **0.70**

Confidence: **0.68**

Provenance: Seznam Zprávy 2023; Eurobarometer 2025; Sprout Social 2024.

Notes: Peer visibility is the core driver of adoption lift.

Pattern ID: P003

Pattern Name: Value + Well-Being Framing Converts

Pattern Type: Success

Industry Scope (Primary): Outdoor Living (Pergolas)

Segments Involved: Consumer, Brand

Factors (F#): F11, F14, F15 (+ Brand F16 positioning)

Trigger / Driver: **72%** perceive property value uplift; **55%** cite well-being as primary motivation.

Pre-conditions: Local comps; before/after visuals; simple ROI calculator; lifestyle content.

Strategic Response: Value-uplift case cards; ROI calculators; well-being “routine” content; bundles for scenes.

Outcome Measure(s): Site→quote conversion; AOV/ARPU; time-to-decision.

Outcome Polarity: +

Transferability: High across outdoor categories.

Leading Indicators: Calculator usage; content CTR; quote requests.

Lagging Indicators: Close rate; AOV; returns.

MC Levers: Conversion ↑; AOV ↑; Returns ↓.

Effect Size Hints (priors): Conversion **+3–5 pp**; AOV **+5–8%**.

KPI Anchors (dists):

- Site_to_quote_pp → **Triangular(2, 4, 5)** → maps_to: Conversion
- AOV_change_pct → **Normal(+6%, 2%)**, bounds [+3%, +10%] → maps_to: ARPU/Margin

Probability Range: **0.65–0.80** (Confidence 0.75 ± 0.10).

Variance / Sensitivity: Price elasticity; credibility of comps; financing availability.

Evidence Strength: **0.78**

Confidence: **0.75**

Provenance: MPO Home Equity 2024; Ipsos Europe 2024; Zillow 2022; CZ buyer quotes.

Notes: Pair with on-site financing to shorten decision cycles.

Pattern ID: P004

Pattern Name: Access ≠ Adoption (Hidden Friction)

Pattern Type: Fragility

Industry Scope (Primary): Outdoor Living (Pergolas)

Segments Involved: Consumer, Ops

Factors (F#): F11, F15

Trigger / Driver: High access (**78%**) but **18%** 12-month installs → post-quote friction.

Pre-conditions: Opaque lead times; manual scheduling; seasonal backlog.

Strategic Response: Live lead-time tracker; slot-picker; clear “no-permit under threshold” guidance; install-day clarity.

Outcome Measure(s): Quote→install conversion; median lead time; cancellations.

Outcome Polarity: – baseline (mitigated to + with response).

Transferability: High to any install-dependent product.

Leading Indicators: Slot holds; deposit rate; lead-time variance.

Lagging Indicators: ≤60-day installs; cancellation rate.

MC Levers: Conversion ↑; Lead time ↓; Velocity ↑.

Effect Size Hints (priors): Lead time **–25–35%**; ≤60-day installs **+8–10 pp**.

KPI Anchors (dists):

- Lead_time_change_pct → **Normal(–30%, 8%)**, bounds [–60%, 0%] → maps_to: LeadTime
- Quote_to_install_pp → **Triangular(6, 9, 11)** → maps_to: Conversion

Probability Range: **0.60–0.78** (Confidence 0.70 ± 0.10).

Variance / Sensitivity: Permit rules; installer bottlenecks; seasonality spikes.

Evidence Strength: **0.72**

Confidence: **0.70**

Provenance: MPO Distribution 2024; ČSÚ Seasonal Usage 2024; CZ permit refs (jurisdiction-specific).

Notes: Treat this as a risk pattern that becomes opportunity with ops fixes.

Pattern ID: P005

Pattern Name: Upgrade-Led Prestige & Innovation Lift

Pattern Type: Adaptation

Industry Scope (Primary): Outdoor Living (Pergolas)

Segments Involved: Consumer, Brand

Factors (F#): F14, F15 (+ Brand F16)

Trigger / Driver: Low prestige (**24%**), mid innovation view (**43%**), trend adoption **~46%/24m**.

Pre-conditions: Installed base; clear upgrade path; financing; AR try-on assets.

Strategic Response: Weather-intelligent bundles (sensors, presets); Month-3 upgrade credit; AR try-before-buy in showroom.

Outcome Measure(s): Upgrade attach %; ASP; AR usage.

Outcome Polarity: +

Transferability: High for modular outdoor products.

Leading Indicators: AR sessions; upgrade quotes; preset trials.

Lagging Indicators: Upgrade attach %; ASP margin uplift.

MC Levers: ARPU/ASP ↑; Retention ↑.

Effect Size Hints (priors): Trend adoption **+8–12 pp**; ASP **+6–10%**.

KPI Anchors (dists):

- Upgrade_attach_pp → **Triangular(6, 9, 12)** → maps_to: ARPU/Margin
- ASP_change_pct → **Normal(+8%, 3%)**, bounds [+4%, +12%] → maps_to: ARPU/Margin

Probability Range: **0.55–0.70** (Confidence 0.65 ± 0.10).

Variance / Sensitivity: Credit acceptance; UX of upgrade flow; supply of add-ons.

Evidence Strength: **0.68**

Confidence: **0.65**

Provenance: Czech Innovation Tracker 2025; Houzz Smart Home 2023; CZ design press.

Notes: Position upgrades as rituals (“morning breeze”, “evening dining”).

Pattern ID: P006

Pattern Name: Service Moat for Retention

Pattern Type: Success

Industry Scope (Primary): Outdoor Living; Adjacent Home Services

Segments Involved: Consumer, Brand

Factors (F#): F13 (+ Experience F22)

Trigger / Driver: Low switching cost; price-led choices; weak advocacy.

Pre-conditions: Service ops & CRM cadence; warranty terms; seasonal check workflows.

Strategic Response: 5-year care plan; extended warranty; “loss-of-season” guarantee; accessories compatibility program.

Outcome Measure(s): 12-month retention; churn; NRR.

Outcome Polarity: +

Transferability: High where install/service matters (pergolas, spas, HVAC).

Leading Indicators: Care-plan attach; warranty attach; proactive outreach rate.

Lagging Indicators: Churn-12m; NRR; repeat accessory purchases.

MC Levers: Retention ↑; Churn ↓; NRR ↑.

Effect Size Hints (priors): Retention **+4–7 pp**; trust **+5–7 pts** (survey).

KPI Anchors (dists):

- Retention_12m_pp → **Triangular(4, 6, 7)** → maps_to: Retention/NRR
- Churn_change_pp → **Normal(–3, 1.5)**, bounds [–6, 0] → maps_to: Churn

Probability Range: **0.57–0.75** (Confidence 0.67 ± 0.10).

Variance / Sensitivity: Service SLA adherence; installer quality; parts availability.

Evidence Strength: **0.70**

Confidence: 0.67

Provenance: CZ procurement price-bias observations; loyalty/trust datasets; category analogs (spas/HVAC).

Notes: Tie touchpoints to weather events (storm/heat checks).

Pattern ID: P007

Pattern Name: Onboarding to Daily Routines

Pattern Type: Success

Industry Scope (Primary): Outdoor Living (Pergolas)

Segments Involved: Consumer, Experience

Factors (F#): F12, F13 (+ Exp F23)

Trigger / Driver: 42% weekly adjustments; frequent evening-dining usage.

Pre-conditions: Simple controls; preset scenes; install-day coaching.

Strategic Response: Install-day onboarding; saved presets ("morning breeze / evening dining"); micro-nudges in month-1.

Outcome Measure(s): Weekly active use; preset adoption; review rate.

Outcome Polarity: +

Transferability: High to configurable products.

Leading Indicators: Preset activations; DAU/WAU (if app); tip sheet opens.

Lagging Indicators: Review rate; NPS; accessory attach.

MC Levers: Retention ↑; Advocacy ↑.

Effect Size Hints (priors): Weekly-use **+10–15 pp**; review rate **+3–5 pp**.

KPI Anchors (dists):

- Weekly_use_pp → **Triangular(10, 12, 15)** → maps_to: Retention
- Review_rate_pp → **Triangular(3, 4, 5)** → maps_to: Advocacy/NPS

Probability Range: **0.54–0.72** (Confidence 0.64 ± 0.10).

Variance / Sensitivity: Control UX; family adoption; weather season length.

Evidence Strength: 0.66

Confidence: 0.64

Provenance: Ipsos CZ Outdoors 2025; CZ usage quotes.

Notes: Rituals cement habit formation; pair with accessory bundles.

Pattern ID: P008

Pattern Name: Energy Integration Advantage

Pattern Type: Success

Industry Scope (Primary): Outdoor Living / Solar / Smart Home

Segments Involved: Product, Market, Consumer

Factors (F#): F1, F6, F11, F15

Trigger / Driver: Outdoor products paired with solar/energy savings show **+25–30% adoption uplift**.

Pre-conditions: Rooftop/yard solar potential; rising energy prices; supportive subsidies.

Strategic Response: Pergola + solar roof bundles; “shade + save” marketing; plug-and-play storage integration.

Outcome Measure(s): Bundle attach %; energy ROI payback; ARPU.

Outcome Polarity: +

Transferability: High across climates with solar incentives.

Leading Indicators: Quote bundle request %; subsidy application rate.

Lagging Indicators: Bundle attach %; energy savings realized.

MC Levers: Adoption ↑; ARPU ↑; ROI payback ↓.

Effect Size Hints (priors): Bundle attach **+15–20 pp**; payback **–2–3 years**.

KPI Anchors (dists):

- Bundle_attach_pp → **Triangular(12, 16, 20)** → maps_to: Adoption/Conversion
- ROI_payback_change_yrs → **Normal(-2.5, 0.7)**, bounds [-4, -1] → maps_to: ROI/Payback

Probability Range: 0.62–0.80

Variance / Sensitivity: Subsidy stability; consumer energy awareness.

Evidence Strength: 0.74

Confidence: 0.70

Provenance: Alukov Solar Pergola GCC; Statista EU solar adoption 2024.

Notes: Strong crossover with EV charging shelter patterns.

Pattern ID: P009

Pattern Name: Dealer Trust Advantage

Pattern Type: Success

Industry Scope (Primary): Outdoor Living / HVAC / Solar

Segments Involved: Brand, Experience

Factors (F#): F13, F17, F22

Trigger / Driver: Dealer/installer networks deliver **75% retention** vs **62%** direct-to-consumer.

Pre-conditions: Skilled local installers; service agreements; warranty integration.

Strategic Response: Protected dealer territories; co-branded training; install+service guarantees.

Outcome Measure(s): Retention; churn; average customer lifetime revenue.

Outcome Polarity: +

Transferability: High where install/service is critical.

Leading Indicators: Dealer program adoption; training completion rates.

Lagging Indicators: Retention %, churn %, NRR.

MC Levers: Retention ↑; CAC ↑ (trade-off).

Effect Size Hints (priors): Retention **+10–13 pp**; churn **–5–8 pp**.

KPI Anchors (dists):

- Retention_change_pp → **Triangular(8, 10, 13)** → maps_to: Retention/NRR
- CAC_change_pct → **Normal(+15%, 4%)**, bounds [+8%, +25%] → maps_to: CAC

Probability Range: **0.65–0.82**

Variance / Sensitivity: Dealer quality variance; brand control; warranty discipline.

Evidence Strength: **0.78**

Confidence: **0.73**

Provenance: Sunrun vs Tesla Solar CAC & retention; Hot Tub Serum dealer network.

Notes: CAC is higher, but LTV/retention offsets.

Pattern ID: P010

Pattern Name: DIY Cost Disruption

Pattern Type: Success / Fragility (dual)

Industry Scope (Primary): Outdoor Living / Furniture / Modular

Segments Involved: Consumer, Market

Factors (F#): F11, F12, F5

Trigger / Driver: DIY/kit options are ~50% cheaper but risk service gaps.

Pre-conditions: Strong DIY culture; accessible distribution; simple assembly.

Strategic Response: Flat-pack kits; YouTube install support; option to upgrade with pro add-ons.

Outcome Measure(s): Price vs. adoption; service complaint rates.

Outcome Polarity: Mixed (+ volume, – retention/service).

Transferability: High in price-sensitive markets.

Leading Indicators: DIY kit sales %; assembly video engagement.

Lagging Indicators: Retention; warranty claims.

MC Levers: Adoption ↑; Retention ↓; CAC ↓.

Effect Size Hints (priors): Adoption **+15–20 pp**; service issues **+8–12 pp**.

KPI Anchors (dists):

- Adoption_pp → **Triangular(12, 16, 20)** → maps_to: Adoption
- Retention_change_pp → **Normal(-8, 2)**, bounds [-12, -5] → maps_to: Retention

Probability Range: **0.55–0.75**

Variance / Sensitivity: Culture fit; product complexity; warranty support.

Evidence Strength: **0.68**

Confidence: **0.66**

Provenance: IKEA vs RH; Pergola kit vs custom install data.

Notes: Should be flagged as bifurcated outcome pattern.

Pattern ID: P011

Pattern Name: Service Ecosystem Bundling

Pattern Type: Success

Industry Scope (Primary): Outdoor Living / Spas / Smart Home

Segments Involved: Brand, Consumer, Experience

Factors (F#): F13, F19, F22

Trigger / Driver: Bundles (spa + lighting + chemical system) yield **ARPU +25–40%**, retention **+20–30%**.

Pre-conditions: Accessory catalog; recurring consumables; app integration.

Strategic Response: Sell project kits; app-based reminders; subscription refills.

Outcome Measure(s): ARPU; cross-sell attach %; retention.

Outcome Polarity: +

Transferability: High to modular or add-on friendly categories.

Leading Indicators: Bundle attach %; subscription sign-ups.

Lagging Indicators: ARPU; churn; upsell %.

MC Levers: ARPU ↑; Retention ↑; CAC neutral.

Effect Size Hints (priors): ARPU **+25–40%**; Retention **+20–25 pp**.

KPI Anchors (dists):

- ARPU_change_pct → **Triangular(25, 30, 40)** → maps_to: ARPU
- Retention_change_pp → **Triangular(18, 22, 25)** → maps_to: Retention

Probability Range: 0.66–0.84

Variance / Sensitivity: Cross-sell UX; subscription stickiness.

Evidence Strength: 0.80

Confidence: 0.75

Provenance: Hot tub FROG, Jacuzzi, TimberTech bundling.

Notes: Recurring consumables are the strongest anchor.

Pattern ID: P012

Pattern Name: Vertical Integration Moat

Pattern Type: Success

Industry Scope (Primary): Construction / Solar / Modular / Manufacturing

Segments Involved: Product, Market, Brand

Factors (F#): F4, F6, F19

Trigger / Driver: Controlling core supply chain reduces cost volatility and accelerates installs.

Pre-conditions: Scale to justify facilities; stable demand; material access.

Strategic Response: Backward integrate critical materials; standardize modules; in-house key manufacturing.

Outcome Measure(s): Cost savings; lead-time reductions; margin stability.

Outcome Polarity: +

Transferability: Medium–high (scale required).

Leading Indicators: % self-sufficiency; supplier dependence ratio.

Lagging Indicators: EBITDA margin; backlog stability.

MC Levers: Cost ↓; Margin ↑; Velocity ↑.

Effect Size Hints (priors): Cost advantage **+25–85%**; speed **+20–67%**.

KPI Anchors (dists):

- Cost_advantage_pct → **Triangular(25, 45, 85)** → maps_to: Cost/Margin
- Speed_gain_pct → **Triangular(20, 35, 67)** → maps_to: Velocity/LeadTime

Probability Range: **0.60–0.82**

Variance / Sensitivity: Capital intensity; downturn exposure; tech lock-in.

Evidence Strength: **0.77**

Confidence: **0.72**

Provenance: SpaceX (85% in-house), STRABAG (asphalt/concrete), Persimmon (timber/bricks), Lindbäcks Bygg (modules).

Notes: Scale is the gating factor; fragility if market contracts.

Pattern ID: P013

Pattern Name: Dealer Lock-in via Exclusivity

Pattern Type: Success

Industry Scope (Primary): Hot Tubs / Outdoor Living / HVAC

Segments Involved: Brand, Experience

Factors (F#): F13, F17, F22

Trigger / Driver: Exclusive dealer territories + lifetime service agreements drive loyalty.

Pre-conditions: Local service providers with protected territories; warranty incentives.

Strategic Response: Assign protected regions; bundle chemicals/service; enforce exclusivity.

Outcome Measure(s): Retention; ARPU; dealer profitability.

Outcome Polarity: +

Transferability: Medium (works in products w/ recurring service).

Leading Indicators: Dealer sign-up rate; territory compliance.

Lagging Indicators: Retention; repeat purchase share.

MC Levers: Retention ↑; ARPU ↑.

Effect Size Hints (priors): Retention **+15–20 pp**; ARPU **+25–40%**.

KPI Anchors (dists):

- Retention_change_pp → **Triangular(15, 18, 20)** → maps_to: Retention
- ARPU_change_pct → **Triangular(25, 32, 40)** → maps_to: ARPU

Probability Range: 0.65–0.82

Variance / Sensitivity: Risk of dealer complacency; conflict with D2C.

Evidence Strength: 0.78

Confidence: 0.73

Provenance: Hot Tub Serum dealer model; HVAC franchise vs independent retention.

Notes: Exclusivity must balance with consumer access.

Pattern ID: P014

Pattern Name: Outcome-Based Service Contracts

Pattern Type: Success / Fragility (dual)

Industry Scope (Primary): Solar / Construction / HVAC

Segments Involved: Market, Brand

Factors (F#): F5, F19

Trigger / Driver: Charging based on outcomes (kWh produced, uptime).

Pre-conditions: Reliable monitoring tech; contractual enforcement.

Strategic Response: Offer PPAs; performance guarantees; monitoring dashboards.

Outcome Measure(s): Customer churn; profitability; system performance.

Outcome Polarity: Mixed (+ trust, – financial risk if underperformance).

Transferability: Medium (works best in energy or measurable outputs).

Leading Indicators: Monitoring adoption; SLA sign-ups.

Lagging Indicators: Customer churn; performance payout %.

MC Levers: Retention ↑; Margin variability ↑.

Effect Size Hints (priors): Retention **+10–15 pp**; margin volatility **±8–12%**.

KPI Anchors (dists):

- Retention_change_pp → **Triangular(10, 12, 15)** → maps_to: Retention
- Margin_volatility_pct → **Normal(±10, 4)**, bounds [–12, +12] → maps_to: Margin Risk

Probability Range: 0.55–0.75

Variance / Sensitivity: Weather risk; capex stability.

Evidence Strength: 0.70

Confidence: 0.66

Provenance: Solar PPAs; performance-based construction contracts.

Notes: Needs hedging to avoid fragility.

Pattern ID: P015

Pattern Name: Long-Tail Niche Expansion

Pattern Type: Success

Industry Scope (Primary): E-commerce / Furniture / Outdoor Components

Segments Involved: Market, Consumer

Factors (F#): F7, F11, F12

Trigger / Driver: Selling many niche SKUs at low volume expands revenue.

Pre-conditions: Strong logistics; digital cataloging; demand fragmentation.

Strategic Response: Expand SKU variety; online configurators; micro-bundles.

Outcome Measure(s): Revenue growth; attach rate of niche SKUs.

Outcome Polarity: +

Transferability: High in modular categories.

Leading Indicators: Niche SKU adoption %; online configurator usage.

Lagging Indicators: Incremental revenue %; inventory turnover.

MC Levers: Revenue ↑; Complexity ↑.

Effect Size Hints (priors): Revenue growth **+5–10%**; complexity cost **+3–6%**.

KPI Anchors (dists):

- Revenue_change_pct → **Triangular(5, 7, 10)** → maps_to: Revenue
- Complexity_cost_pct → **Normal(4, 1.5)**, bounds [3, 6] → maps_to: Cost/Complexity

Probability Range: **0.60–0.80**

Variance / Sensitivity: SKU bloat risk; warehouse mgmt.

Evidence Strength: **0.72**

Confidence: **0.70**

Provenance: Trex niche railing profiles; modular furniture add-ons.

Notes: Failure risk if SKU management weak.

Pattern ID: P016

Pattern Name: Subscription Lock-In

Pattern Type: Success

Industry Scope (Primary): Spas / Solar / Smart Home

Segments Involved: Consumer, Experience

Factors (F#): F13, F22, F19

Trigger / Driver: Recurring consumable/service subscriptions boost ARPU & retention.

Pre-conditions: Consumables or maintenance cycles; subscription tech.

Strategic Response: Auto-ship programs; bundled subscriptions; app reminders.

Outcome Measure(s): ARPU; retention; churn.

Outcome Polarity: +

Transferability: High in consumable/service-linked categories.

Leading Indicators: Subscription sign-ups; renewal % in year 1.

Lagging Indicators: ARPU; churn %.

MC Levers: Retention ↑; ARPU ↑; Churn ↓.

Effect Size Hints (priors): ARPU **+20–40%**; Retention **+15–20 pp**.

KPI Anchors (dists):

- ARPU_change_pct → **Triangular(20, 30, 40)** → maps_to: ARPU
- Retention_change_pp → **Triangular(15, 17, 20)** → maps_to: Retention

Probability Range: **0.65–0.83**

Variance / Sensitivity: Subscription fatigue risk; pricing pressure.

Evidence Strength: **0.78**

Confidence: **0.74**

Provenance: FROG water-care, HotSpring FreshWater Salt, Solar monitoring subscriptions.

Notes: High stickiness if consumable dependency is real.

Pattern ID: P017

Pattern Name: Crowdsourcing & Design Contests

Pattern Type: Fragility

Industry Scope (Primary): Prefab / Furniture / Design

Segments Involved: Consumer, Market

Factors (F#): F11, F14, F10

Trigger / Driver: Using community design input to co-create products.

Pre-conditions: Active design community; IP/legal safeguards.

Strategic Response: Run design contests; offer royalties; incubate top ideas.

Outcome Measure(s): Design adoption %; time-to-market.

Outcome Polarity: – (low yield).

Transferability: Low–medium (only works where design crowd is active).

Leading Indicators: Submissions volume; contest participation.

Lagging Indicators: % of designs commercialized; incremental revenue.

MC Levers: Innovation ↑; Cost ↑; Adoption low.

Effect Size Hints (priors): Adoption rate ~2%; time-to-market ↑ +20–30% delays.

KPI Anchors (dists):

- Design_adoption_rate_pct → **Normal(2, 1.5)**, bounds [0, 5] → maps_to: Innovation/Adoption
- Time_to_market_delay_pct → **Triangular(20, 25, 30)** → maps_to: Velocity

Probability Range: 0.35–0.55

Variance / Sensitivity: Winner's curse; IP disputes.

Evidence Strength: 0.55

Confidence: 0.50

Provenance: Modular design crowdsourcing case (2% adoption); limited furniture AR/VR free models.

Notes: Rarely scalable — pattern mostly fragile.

Pattern ID: P018

Pattern Name: White-Label OEM Expansion

Pattern Type: Success

Industry Scope (Primary): Furniture / Decking / Solar

Segments Involved: Market, Brand

Factors (F#): F4, F16, F19

Trigger / Driver: Producing goods for others under their brand expands scale.

Pre-conditions: Excess capacity; standardized product; reliable quality.

Strategic Response: OEM boards, components, or panels under local brands.

Outcome Measure(s): Volume growth; margin trade-off; channel penetration.

Outcome Polarity: +

Transferability: High for standardized components.

Leading Indicators: OEM contracts signed; factory utilization.

Lagging Indicators: Volume growth; OEM margin contribution.

MC Levers: Volume ↑; Margin ↓.

Effect Size Hints (priors): Volume **+10–20%**; margin erosion **–5–10%**.

KPI Anchors (dists):

- Volume_growth_pct → **Triangular(10, 15, 20)** → maps_to: Revenue/Volume
- Margin_change_pct → **Normal(–7, 2)**, bounds [–10, –5] → maps_to: Margin

Probability Range: 0.62–0.80

Variance / Sensitivity: Brand dependence risk; price squeeze.

Evidence Strength: 0.70

Confidence: 0.68

Provenance: Trex white-label OEM boards; solar OEM panels.

Notes: Works best with scale excess + low differentiation.

Pattern ID: P019

Pattern Name: Pay-as-You-Go / PPA Leasing

Pattern Type: Success

Industry Scope (Primary): Solar / HVAC / Equipment

Segments Involved: Market, Consumer

Factors (F#): F11, F12, F19

Trigger / Driver: Customers pay only for use (kWh, hours, cycles) vs. upfront capex.

Pre-conditions: Financing structures; reliable usage tracking; customer trust.

Strategic Response: Offer solar PPAs, HVAC hourly billing, equipment leasing packages.

Outcome Measure(s): Adoption rate; customer base expansion; churn.

Outcome Polarity: +

Transferability: Medium–high (energy, equipment, recurring-use industries).

Leading Indicators: PPA sign-ups; leasing penetration %.

Lagging Indicators: ROI realization; churn.

MC Levers: Adoption ↑; Margin compression.

Effect Size Hints (priors): Adoption lift **+20–30%**; margins **–5–10%**.

KPI Anchors (dists):

- Adoption_rate_increase_pct → **Triangular(20, 25, 30)** → maps_to: Adoption
- Margin_change_pct → **Normal(–7, 2)**, bounds [–10, –5] → maps_to: Margin

Probability Range: 0.65–0.82

Variance / Sensitivity: Dependent on capital cost of financing; regulatory exposure.

Evidence Strength: 0.74

Confidence: 0.70

Provenance: Sunrun PPAs; Caterpillar equipment leasing; HVAC hourly billing.

Notes: Strong adoption booster in cost-sensitive markets.

Pattern ID: P020

Pattern Name: Leasing & Rentals as Market Entry

Pattern Type: Success

Industry Scope (Primary): Construction / Tools / Outdoor Equipment

Segments Involved: Market, Consumer

Factors (F#): F11, F19

Trigger / Driver: Renting capital-intensive equipment lowers barriers for entry.

Pre-conditions: Sufficient local demand; fleet management systems.

Strategic Response: Offer leasing bundles; support with insurance and maintenance.

Outcome Measure(s): Fleet utilization; ROI on leased assets; customer reach.

Outcome Polarity: +

Transferability: Medium (works in heavy or seasonal-use categories).

Leading Indicators: Leasing contract growth; fleet utilization %.

Lagging Indicators: Profit margins; customer lifetime value.

MC Levers: Adoption ↑; Utilization ↑.

Effect Size Hints (priors): Utilization **+15–20%**; adoption **+10–15%**.

KPI Anchors (dists):

- Utilization_increase_pct → **Triangular(15, 18, 20)** → maps_to: Efficiency
- Adoption_rate_increase_pct → **Triangular(10, 12, 15)** → maps_to: Adoption

Probability Range: 0.60–0.78

Variance / Sensitivity: Admin overhead; maintenance costs.

Evidence Strength: 0.72

Confidence: 0.68

Provenance: Caterpillar equipment leasing; tool-rental subscription trials.

Notes: Fragile when admin cost > utilization gain.

Pattern ID: P021

Pattern Name: Auction-Based Sales Channels

Pattern Type: Fragility

Industry Scope (Primary): Furniture / Reclaimed Materials / Specialty Products

Segments Involved: Market, Brand

Factors (F#): F4, F16, F18

Trigger / Driver: Selling via auctions drives price spikes but inconsistent volume.

Pre-conditions: High-perceived uniqueness or scarcity.

Strategic Response: Leverage auction platforms for reclaimed or luxury materials.

Outcome Measure(s): Price premium; liquidity; repeat buyer rate.

Outcome Polarity: Mixed — higher margins, poor repeatability.

Transferability: Low outside niche/luxury.

Leading Indicators: Auction participation; bid prices.

Lagging Indicators: Repeat purchases; channel contribution %.

MC Levers: Margin ↑; Adoption ↓.

Effect Size Hints (priors): Margin premium **+10–15%**; adoption growth negligible.

KPI Anchors (dists):

- Margin_premium_pct → **Triangular(10, 12, 15)** → maps_to: Margin
- Repeat_purchase_rate_pct → **Normal(5, 2)**, bounds [0, 10] → maps_to: Retention

Probability Range: **0.40–0.60**

Variance / Sensitivity: High volatility; hard to scale.

Evidence Strength: **0.55**

Confidence: **0.50**

Provenance: Salvage lumber auctions; reclaimed furniture resale.

Notes: Mostly opportunistic, not scalable.

Pattern ID: P022

Pattern Name: Multi-Sided Platforms

Pattern Type: Success

Industry Scope (Primary): Smart Home / Solar / Marketplaces

Segments Involved: Market, Consumer, Brand

Factors (F#): F3, F4, F12, F16, F19

Trigger / Driver: Platforms connect multiple customer types (e.g., device makers + users).

Pre-conditions: Interoperability; sufficient network scale.

Strategic Response: Build platform hub (e.g., smart-home hub, solar installer marketplace).

Outcome Measure(s): Cross-sell; adoption speed; CAC reduction.

Outcome Polarity: +

Transferability: High across tech-enabled industries.

Leading Indicators: Partner sign-ups; cross-sell %.

Lagging Indicators: ARPU; churn.

MC Levers: Adoption ↑; ARPU ↑; Retention ↑.

Effect Size Hints (priors): Cross-sell **+20–30%**; adoption speed **+15–20%**.

KPI Anchors (dists):

- Cross_sell_increase_pct → **Triangular(20, 25, 30)** → maps_to: ARPU
- Adoption_speed_pct → **Triangular(15, 18, 20)** → maps_to: Adoption

Probability Range: 0.68–0.85

Variance / Sensitivity: Platform failure if network scale not reached.

Evidence Strength: 0.76

Confidence: 0.72

Provenance: EnergySage (solar marketplace), Samsung SmartThings.

Notes: Winner-takes-most dynamics.

Pattern ID: P023

Pattern Name: Affiliate / Referral Boost

Pattern Type: Success

Industry Scope (Primary): Solar / Furniture / E-commerce

Segments Involved: Market, Brand

Factors (F#): F18, F16, F19

Trigger / Driver: Incentivizing referrals cuts CAC and expands reach.

Pre-conditions: Trusted network; clear incentive design.

Strategic Response: Offer cash-back, discounts, or service credits for referrals.

Outcome Measure(s): CAC; customer growth.

Outcome Polarity: +

Transferability: High (broad adoption possible).

Leading Indicators: Referral sign-ups; cost per referral.

Lagging Indicators: CAC; customer growth.

MC Levers: CAC ↓; Adoption ↑.

Effect Size Hints (priors): CAC **-20–25%**; adoption growth **+10–15%**.

KPI Anchors (dists):

- CAC_change_pct → **Triangular(-25, -22, -20)** → maps_to: CAC
- Adoption_rate_increase_pct → **Triangular(10, 12, 15)** → maps_to: Adoption

Probability Range: **0.65–0.80**

Variance / Sensitivity: Over-incentivization erodes margin.

Evidence Strength: **0.72**

Confidence: **0.70**

Provenance: Sunrun referral CAC drop (-25%); furniture affiliate performance.

Notes: Easy to scale, risk of quality dilution.

Pattern ID: P024

Pattern Name: Add-On Attach Sales

Pattern Type: Success

Industry Scope (Primary): Decking / Pergolas / Outdoor Accessories

Segments Involved: Consumer, Market

Factors (F#): F12, F19, F7

Trigger / Driver: Selling accessories after core purchase (e.g., lighting, shades).

Pre-conditions: Strong attach opportunities; upsell culture.

Strategic Response: Design modular accessories; integrate easy install; bundle discounts.

Outcome Measure(s): Attach rate; ARPU.

Outcome Polarity: +

Transferability: Very high in modular or lifestyle-driven products.

Leading Indicators: Attach SKU adoption rate.

Lagging Indicators: ARPU lift; repeat purchase %.

MC Levers: ARPU ↑; Retention ↑.

Effect Size Hints (priors): ARPU **+20–25%**; attach rate **+50–60%** in decking.

KPI Anchors (dists):

- ARPU_change_pct → **Triangular(20, 22, 25)** → maps_to: ARPU
- Attach_rate_pct → **Triangular(50, 55, 60)** → maps_to: Adoption/ARPU

Probability Range: **0.70–0.85**

Variance / Sensitivity: Add-on fatigue if core product isn't compelling.

Evidence Strength: **0.76**

Confidence: **0.72**

Provenance: Trex decking lighting add-ons; pergola shade sail attachments.

Notes: Attach rate resilience proven in decking.

Pattern ID: P025

Pattern Name: Crowdfunding for Capital-Intensive Products

Pattern Type: Fragility

Industry Scope (Primary): Modular Housing / Furniture / Solar Pilots

Segments Involved: Market, Consumer

Factors (F#): F19, F11, F26

Trigger / Driver: Small investors fund new projects in exchange for early access or equity.

Pre-conditions: Community trust; transparent project pipeline.

Strategic Response: Use crowdfunding for pilot modular housing or eco furniture launches.

Outcome Measure(s): Funds raised vs. delivered projects; investor satisfaction.

Outcome Polarity: Mixed (funding success, delivery failures common).

Transferability: Limited — niche/local markets.

Leading Indicators: % of campaign funded; investor count.

Lagging Indicators: Delivered units; refund rate.

MC Levers: Adoption ↑; Risk ↑.

Effect Size Hints (priors): Funding success ~70–80%; delivery <50%.

KPI Anchors (dists):

- Campaign_success_rate_pct → **Triangular(70, 75, 80)** → maps_to: Adoption
- Delivery_success_rate_pct → **Triangular(35, 40, 50)** → maps_to: Risk

Probability Range: 0.40–0.65

Variance / Sensitivity: Execution risks dominate.

Evidence Strength: 0.55

Confidence: 0.48

Provenance: Prefab housing equity campaigns (EU, 2020s).

Notes: Good for pilots, fragile in scaling.

Pattern ID: P026

Pattern Name: Razor-and-Financing (Device + Loan Revenue)

Pattern Type: Success

Industry Scope (Primary): Solar / Furniture / Consumer Durables

Segments Involved: Market, Consumer

Factors (F#): F5, F11, F13

Trigger / Driver: Low-margin core product paired with financing margin.

Pre-conditions: Credit scoring system; recurring billing.

Strategic Response: Pair solar panels, pergolas, or furniture with BNPL or long-term loans.

Outcome Measure(s): Adoption; loan repayment performance.

Outcome Polarity: +

Transferability: High in mid-to-high-ticket goods.

Leading Indicators: BNPL uptake; loan default rate.

Lagging Indicators: CLV; ARPU.

MC Levers: Adoption ↑; Margin ↑.

Effect Size Hints (priors): AOV ↑ 20–25%; default <3%.

KPI Anchors (dists):

- AOV_change_pct → **Triangular(20, 22, 25)** → maps_to: ARPU
- Loan_default_rate_pct → **Normal(3, 1)**, bounds [0, 5] → maps_to: Risk

Probability Range: 0.70–0.85

Variance / Sensitivity: Exposure to credit risk.

Evidence Strength: 0.78

Confidence: 0.72

Provenance: Affirm BNPL (furniture); Solar loans renewal rates >70%.

Notes: Works best when repayment manageable.

Pattern ID: P027

Pattern Name: Shared-Resource Infrastructure

Pattern Type: Adaptation

Industry Scope (Primary): Solar / Microgrids / Community Housing

Segments Involved: Market, Consumer

Factors (F#): F26, F11, F19

Trigger / Driver: Multiple users share costly infrastructure.

Pre-conditions: Community governance; grid/regulatory approval.

Strategic Response: Deploy community microgrids; shared pergolas in condos.

Outcome Measure(s): Cost per user; adoption rate.

Outcome Polarity: + in rural / community-driven settings.

Transferability: Limited to regulated or cooperative environments.

Leading Indicators: Sign-ups; cost per kWh/user.

Lagging Indicators: Retention; ROI.

MC Levers: Adoption ↑; Risk ↑.

Effect Size Hints (priors): Cost reduction **20–30%**; adoption ↑ ~15%.

KPI Anchors (dists):

- Cost_reduction_pct → **Triangular(20, 25, 30)** → maps_to: Margin
- Adoption_rate_increase_pct → **Triangular(10, 12, 15)** → maps_to: Adoption

Probability Range: 0.55–0.72

Variance / Sensitivity: Governance, regulatory shifts.

Evidence Strength: 0.62

Confidence: 0.56

Provenance: Rural electrification pilots; condo shared amenities.

Notes: Works as adaptation where individual purchase impossible.

Pattern ID: P028

Pattern Name: Orchestrator Model (Coordination without Assets)

Pattern Type: Success

Industry Scope (Primary): Home Services / Installers / Marketplaces

Segments Involved: Market, Brand

Factors (F#): F4, F16, F19

Trigger / Driver: Coordinating external providers creates integrated service without owning assets.

Pre-conditions: Strong brand trust; partner quality monitoring.

Strategic Response: Use platform (e.g., Angie's List, HomeAdvisor) to coordinate installs.

Outcome Measure(s): Booking speed; customer satisfaction.

Outcome Polarity: Mixed (fast adoption, retention risks).

Transferability: High in fragmented service markets.

Leading Indicators: Booking volume; partner onboarding.

Lagging Indicators: Retention; service quality.

MC Levers: Adoption ↑; Retention ↓.

Effect Size Hints (priors): Booking speed +30%; repeat usage 40–50%.

KPI Anchors (dists):

- Booking_speed_increase_pct → **Triangular(25, 30, 35)** → maps_to: Adoption
- Repeat_usage_rate_pct → **Triangular(40, 45, 50)** → maps_to: Retention

Probability Range: 0.55–0.75

Variance / Sensitivity: Service quality variability.

Evidence Strength: 0.65

Confidence: 0.60

Provenance: Angie's List / HomeAdvisor; service platform reviews.

Notes: Scalable but fragile if partner quality poor.

Pattern ID: P029

Pattern Name: Outcome-Based Contracting

Pattern Type: Adaptation

Industry Scope (Primary): Solar / Construction / Services

Segments Involved: Market, Consumer

Factors (F#): F19, F11, F26

Trigger / Driver: Pricing based on delivered results (kWh, efficiency gain).

Pre-conditions: Reliable performance measurement; trust in supplier.

Strategic Response: Offer solar-as-a-service with guaranteed performance.

Outcome Measure(s): Churn; revenue per contract.

Outcome Polarity: + where performance easily tracked; risky elsewhere.

Transferability: Medium (needs measurable KPIs).

Leading Indicators: Signed performance contracts.

Lagging Indicators: Delivered vs. guaranteed output.

MC Levers: Adoption ↑; Risk ↑.

Effect Size Hints (priors): Churn reduction –5–10%; adoption lift 10–15%.

KPI Anchors (dists):

- Churn_change_pct → **Normal(–7, 2)**, bounds [–10, –5] → maps_to: Retention
- Adoption_rate_increase_pct → **Triangular(10, 12, 15)** → maps_to: Adoption

Probability Range: 0.55–0.70

Variance / Sensitivity: High risk if performance fails.

Evidence Strength: 0.60

Confidence: 0.56

Provenance: Solar PPAs with outcome guarantees; performance-based construction fees.

Notes: Limited adoption; strong in energy-as-service.

Pattern ID: P030

Pattern Name: White Label Production

Pattern Type: Success

Industry Scope (Primary): Construction Materials / Decking / Furniture

Segments Involved: Market, Brand

Factors (F#): F4, F16, F19

Trigger / Driver: Producing goods for rebranding boosts scale.

Pre-conditions: Overcapacity; trusted OEM reputation.

Strategic Response: Sell OEM components (composites, decking boards) under other brands.

Outcome Measure(s): Volume; revenue growth.

Outcome Polarity: +

Transferability: Very high across manufacturing sectors.

Leading Indicators: White-label contracts signed.

Lagging Indicators: Volume share; revenue growth.

MC Levers: Adoption ↑; Margin stable.

Effect Size Hints (priors): Volume growth 10–15%; margin stable.

KPI Anchors (dists):

- Volume_growth_pct → **Triangular(10, 12, 15)** → maps_to: Adoption
- Margin_change_pct → **Normal(0, 1)**, bounds [–2, +2] → maps_to: Margin

Probability Range: 0.72–0.85

Variance / Sensitivity: Brand dilution risk.

Evidence Strength: 0.76

Confidence: 0.72

Provenance: Trex OEM decking; composite boards rebranded by builders.

Notes: Strong growth lever in commoditized markets.

Pattern ID: P031

Pattern Name: Multisided Platforms (Home Services / Smart Homes)

Pattern Type: Success

Industry Scope (Primary): Smart Home / Outdoor Services / Marketplaces

Segments Involved: Market, Brand, Consumer

Factors (F#): F4, F16, F18, F19

Trigger / Driver: Platforms serve multiple groups (consumers, device makers, installers).

Pre-conditions: Strong network effects; interoperability.

Strategic Response: Build or plug into platform ecosystems (e.g., SmartThings).

Outcome Measure(s): Cross-sell rates, ARPU uplift.

Outcome Polarity: +

Transferability: High, esp. digital-first categories.

Leading Indicators: Device partnerships; app downloads.

Lagging Indicators: ARPU; retention.

MC Levers: Adoption ↑; Retention ↑.

Effect Size Hints (priors): ARPU ↑ 20%; cross-sell ↑ 58%.

KPI Anchors (dists):

- ARPU_change_pct → **Triangular(18, 20, 22)** → maps_to: ARPU
- Cross_sell_rate_pct → **Triangular(55, 58, 60)** → maps_to: Adoption

Probability Range: 0.72–0.85

Variance / Sensitivity: Network fragility.

Evidence Strength: 0.75

Confidence: 0.70

Provenance: Samsung SmartThings; Smart Home Hub ecosystems.

Pattern ID: P032

Pattern Name: Affiliate / Referral-Driven Growth

Pattern Type: Success

Industry Scope (Primary): Solar / Furniture / Outdoor Living

Segments Involved: Market, Consumer

Factors (F#): F4, F11, F13

Trigger / Driver: Referral commissions for word-of-mouth acquisition.

Pre-conditions: High customer trust; simple reward structure.

Strategic Response: Launch referral programs (e.g., Sunrun, SolarCity).

Outcome Measure(s): CAC reduction, adoption lift.

Outcome Polarity: +

Transferability: Very high in B2C durable goods.

Leading Indicators: # of referrals; referral-to-conversion ratio.

Lagging Indicators: Retention; CAC trend.

MC Levers: Adoption ↑; CAC ↓.

Effect Size Hints (priors): CAC ↓ ~25%; adoption ↑ 10–12%.

KPI Anchors (dists):

- CAC_reduction_pct → **Triangular(20, 25, 28)** → maps_to: CAC
- Adoption_rate_increase_pct → **Triangular(8, 10, 12)** → maps_to: Adoption

Probability Range: 0.70–0.82

Variance / Sensitivity: Dependent on trust & word-of-mouth.

Evidence Strength: 0.72

Confidence: 0.68

Provenance: Sunrun solar referral programs; furniture affiliate sales.

Pattern ID: P033

Pattern Name: Add-On Sales Expansion

Pattern Type: Success

Industry Scope (Primary): Decking / Pergolas / Furniture

Segments Involved: Consumer, Product

Factors (F#): F11, F13, F7

Trigger / Driver: Core product sale followed by complementary add-ons.

Pre-conditions: Established installed base.

Strategic Response: Bundle lighting, shade sails, railing after core structure sale.

Outcome Measure(s): ARPU uplift, attach rate.

Outcome Polarity: +

Transferability: High in home/living upgrades.

Leading Indicators: Attach rate; accessory SKU penetration.

Lagging Indicators: CLV; ARPU.

MC Levers: ARPU ↑; Retention ↑.

Effect Size Hints (priors): Attach rates 20–60%; ARPU ↑ 20–25%.

KPI Anchors (dists):

- Attach_rate_pct → **Triangular(20, 40, 60)** → maps_to: Adoption
- ARPU_change_pct → **Triangular(18, 22, 25)** → maps_to: ARPU

Probability Range: 0.70–0.85

Variance / Sensitivity: Depends on accessory relevance.

Evidence Strength: 0.73

Confidence: 0.70

Provenance: Deck lighting (TimberTech, Trex); pergola accessories.

Pattern ID: P034

Pattern Name: Auction & Secondary Market Sales

Pattern Type: Adaptation

Industry Scope (Primary): Furniture / Reclaimed Materials / Specialty Goods

Segments Involved: Market

Factors (F#): F3, F4, F5

Trigger / Driver: Real-time bidding unlocks niche material value.

Pre-conditions: Scarce or unique inventory.

Strategic Response: Use auctions for reclaimed wood, specialty pergola finishes.

Outcome Measure(s): Margin uplift, liquidity.

Outcome Polarity: + / niche

Transferability: Limited to high-scarcity goods.

Leading Indicators: Bidders per auction.

Lagging Indicators: Margin uplift; inventory clearance.

MC Levers: Margin ↑; Adoption niche.

Effect Size Hints (priors): Margins ↑ ~10–15%.

KPI Anchors (dists):

- Margin_increase_pct → **Triangular(10, 12, 15)** → maps_to: Margin

Probability Range: 0.50–0.65

Variance / Sensitivity: Supply volatility.

Evidence Strength: 0.55

Confidence: 0.50

Provenance: Salvage lumber auctions; reclaimed furniture resale.

Pattern ID: P035

Pattern Name: Pay-As-You-Go / Pay-Per-Use

Pattern Type: Adaptation

Industry Scope (Primary): Solar / HVAC / Construction Tools

Segments Involved: Market, Consumer

Factors (F#): F5, F11, F13

Trigger / Driver: Customers pay only for usage (kWh, hours).

Pre-conditions: Smart metering; contractual framework.

Strategic Response: Deploy solar PPAs; rental HVAC.

Outcome Measure(s): Adoption lift in price-sensitive segments.

Outcome Polarity: + / niche

Transferability: Strong in emerging markets.

Leading Indicators: PPA sign-ups; billing data.

Lagging Indicators: CLV; churn.

MC Levers: Adoption ↑; Margin stable.

Effect Size Hints (priors): Adoption ↑ 15–20%.

KPI Anchors (dists):

- Adoption_rate_increase_pct → **Triangular(12, 15, 20)** → maps_to: Adoption

Probability Range: 0.55–0.70

Variance / Sensitivity: High billing/admin complexity.

Evidence Strength: 0.62

Confidence: 0.58

Provenance: Sunrun PPAs; HVAC hourly billing pilots.

Pattern ID: P036

Pattern Name: Leasing Models for High-Cost Goods

Pattern Type: Success

Industry Scope (Primary): Construction Equipment / Outdoor Living Assets

Segments Involved: Market, Consumer

Factors (F#): F5, F6, F11

Trigger / Driver: Customers rent instead of buying high-cost durable goods.

Pre-conditions: Asset management system; residual value control.

Strategic Response: Offer leasing for pergolas, hot tubs, modular homes.

Outcome Measure(s): Utilization rates, adoption speed.

Outcome Polarity: +

Transferability: High in capex-heavy categories.

Leading Indicators: Lease sign-ups; utilization % of fleet.

Lagging Indicators: ROI; renewal rate.

MC Levers: Adoption ↑; Margin stable.

Effect Size Hints (priors): Utilization ↑ ~20%; adoption ↑ 10–15%.

KPI Anchors (dists):

- Utilization_rate_increase_pct → **Triangular(15, 20, 25)** → maps_to: Adoption

Probability Range: 0.65–0.78

Variance / Sensitivity: Asset resale risk.

Evidence Strength: 0.70

Confidence: 0.66

Provenance: Caterpillar leasing (+20% utilization); tool/equipment rentals.

Pattern ID: P037

Pattern Name: Mass Customization Platforms

Pattern Type: Success

Industry Scope (Primary): Furniture / Pergolas / Kitchens

Segments Involved: Product, Consumer, Market

Factors (F#): F7, F9, F11

Trigger / Driver: Mass efficiency with customizable options.

Pre-conditions: Digital configurators, modular design.

Strategic Response: Offer modular pergola kits, custom decking via configurators.

Outcome Measure(s): Adoption lift, attach rate.

Outcome Polarity: +

Transferability: Broad across modular industries.

Leading Indicators: Configurator usage; conversion rate.

Lagging Indicators: Attach rates; ARPU.

MC Levers: Adoption ↑; ARPU ↑.

Effect Size Hints (priors): Add-on attach ↑ 8–12%.

KPI Anchors (dists):

- Attach_rate_increase_pct → **Triangular(8, 10, 12)** → maps_to: Adoption

Probability Range: 0.72–0.84

Variance / Sensitivity: Depends on ease-of-use.

Evidence Strength: 0.73

Confidence: 0.70

Provenance: IKEA kitchens; pergola configurators.

Pattern ID: P038

Pattern Name: Vertical Integration Leverage

Pattern Type: Success

Industry Scope (Primary): Construction / Solar / Aerospace / Modular Housing

Segments Involved: Product, Market, Brand

Factors (F#): F4, F6, F19

Trigger / Driver: Owning supply chain stages for cost and speed control.

Pre-conditions: Scale and capital to absorb integration.

Strategic Response: Backward integration (materials), forward integration (installation).

Outcome Measure(s): Cost reductions, margin uplift, speed to market.

Outcome Polarity: +

Transferability: High in scale-driven industries.

Leading Indicators: In-house production %; backlog secured.

Lagging Indicators: Margin stability; on-time delivery.

MC Levers: Cost ↓; Speed ↑; Resilience ↑.

Effect Size Hints (priors): SpaceX 85% cost advantage; Persimmon margin ~27% vs. 15% avg.

KPI Anchors (dists):

- Cost_reduction_pct → **Triangular(20, 30, 40)** → maps_to: Profitability
- Delivery_speed_gain_pct → **Triangular(20, 40, 60)** → maps_to: Adoption/Resilience

Probability Range: 0.75–0.90

Variance / Sensitivity: Capital intensity, demand volatility.

Evidence Strength: 0.85

Confidence: 0.82

Provenance: SpaceX, STRABAG, Persimmon, First Solar, Lindbäcks.

Pattern ID: P039

Pattern Name: Dealer / Installer Network Advantage

Pattern Type: Success

Industry Scope (Primary): Solar / Hot Tubs / HVAC / Pergolas

Segments Involved: Market, Consumer, Brand

Factors (F#): F11, F13, F16, F19

Trigger / Driver: Products requiring professional installation + ongoing service.

Pre-conditions: Complex installs, warranty & maintenance needs.

Strategic Response: Build/expand dealer networks; protect territories.

Outcome Measure(s): Retention rate, CAC, CLV.

Outcome Polarity: +

Transferability: High in service-intensive products.

Leading Indicators: Dealer sign-ups; service contract penetration.

Lagging Indicators: Retention %, CLV uplift.

MC Levers: Retention ↑; CAC ↑; CLV ↑.

Effect Size Hints (priors): Retention 75–85% vs. 60% D2C; CAC ~\$350 vs. \$200 D2C.

KPI Anchors (dists):

- Retention_rate_pct → **Triangular(72, 78, 85)** → maps_to: Retention

Probability Range: 0.70–0.8

Variance / Sensitivity: Service quality variation.

Evidence Strength: 0.78

Confidence: 0.75

Provenance: Sunrun, Hot Tub Serum, HVAC franchises, pergola dealer models.

Pattern ID: P040

Pattern Name: Bundling & Ecosystem Lock-in

Pattern Type: Success

Industry Scope (Primary): Outdoor Living / Solar / Smart Home / Furniture

Segments Involved: Product, Consumer, Brand

Factors (F#): F7, F9, F13, F19

Trigger / Driver: Combining products + services to boost ARPU and retention.

Pre-conditions: Interoperability; cross-category expertise.

Strategic Response: Bundle (deck+lighting+railing); full ecosystem (Tesla energy).

Outcome Measure(s): ARPU uplift, adoption speed, retention.

Outcome Polarity: +

Transferability: High in tech-enabled or lifestyle markets.

Leading Indicators: Bundle attach rates; cross-sell %.

Lagging Indicators: ARPU; churn.

MC Levers: ARPU ↑; Retention ↑; Adoption speed ↑.

Effect Size Hints (priors): ARPU +30%; retention +25%; adoption +37%.

KPI Anchors (dists):

- ARPU_increase_pct → **Triangular(25, 30, 35)** → maps_to: Profitability
- Retention_increase_pct → **Triangular(20, 25, 30)** → maps_to: Retention

Probability Range: 0.75–0.88

Variance / Sensitivity: Bundle complexity; customer fatigue.

Evidence Strength: 0.82

Confidence: 0.80

Provenance: Tesla, FROG Water Care, TimberTech, Trex, Samsung SmartThings.

Pattern ID: P041

Pattern Name: Cost Leadership vs. Premium Differentiation

Pattern Type: Success / Fragility (dual-path)

Industry Scope (Primary): Furniture / Solar / Construction / Modular Housing

Segments Involved: Product, Market, Brand

Factors (F#): F1, F4, F7, F16, F19

Trigger / Driver:

Markets consistently bifurcate between **scale-driven cost leaders** and **design-led premium players**. Middle-market models often underperform.

Pre-conditions:

- **Cost Leadership:** Economies of scale, vertical integration, broad demand base.
- **Premium Differentiation:** Affluent/design-conscious segment, strong service layers, brand equity.

Strategic Response:

- **Cost Leadership:** Lean ops, automation, standardized SKUs, aggressive CAC efficiency.
- **Premium Differentiation:** Concierge service, premium branding, exclusive materials, lifestyle integration.
- **Avoid mid-market traps** (low differentiation + weak scale).

Outcome Measure(s):

Gross margin spread; volume growth; resilience in downturns.

Outcome Polarity: Contextual — clear positioning yields success, mid-market misfit leads to fragility.

Transferability: Universal across B2C durables, housing, and manufacturing.

Leading Indicators: Sales mix by segment; early gross margin trends.

Lagging Indicators: Market share, survival rate in downturns.

MC Levers: Profitability ↔ Volume ↔ Retention

Effect Size Hints (priors):

- IKEA operating margin ~8–10% (scale model).
- RH gross margin ~70%, operating margin ~20% (premium).
- Persimmon net margin ~27% vs. industry 15% (vertical integration).
- Tesla Solar low CAC (\$0.15/W) but weaker retention (62%).
- Sunrun dealer-hybrid: higher CAC but 75% retention.

KPI Anchors (dists):

Gross_margin_pct_lowcost → Triangular(8, 10, 12) → maps_to: Profitability

Gross_margin_pct_premium → Triangular(18, 20, 22) → maps_to: Profitability

Probability Range:

0.72–0.85 (clear fit)

0.40–0.55 (misfit / squeezed mid-market)

Variance / Sensitivity: Macro cycles, supply shocks, consumer sentiment shifts.

Evidence Strength: 0.78

Confidence: 0.74

Provenance: IKEA, Restoration Hardware, Tesla Solar, Sunrun, Persimmon, Lindbäcks, Trex vs. TimberTech.