Consumer Segment Formulas

Consumer Intelligence Score

Overview

Purpose: Measures consumer strength—demand, behavior, loyalty, perception, adoption—predicts user impact (0-1)—targets 95%+ accuracy, 98% via self-learning—integrates with other segments.
Structure: Aggregates 5 factors (F11–F15)—each with 10 layers—weighted, summed, normalized.

Segment Formula: Consumer Intelligence Score

Formula:
C_score(t) = 1 / (1 + e^(-5 × (Raw_Score - 0.5))), where
Raw_Score = 0.9 × (0.3 × F11 + 0.3 × F12 + 0.2 × F13 + 0.15 × F14 + 0.15 × F15) × 0.95 × 0.9 × 0.95 + 0.02
Variables:

F11: Consumer Demand & Need score (0-1)—30% weight.
F12: Consumer Behavior & Habits score (0-1)—30% weight.
F13: Consumer Loyalty & Retention score (0-1)—20% weight.
F14: Consumer Perception & Sentiment score (0-1)—15% weight.
F15: Consumer Adoption & Engagement score (0-1)—15% weight.
n_j(t): Node weight (0-1)—attribute relevance.
N(t): Number of active nodes—signals.
S_gen(t): Scenario generation (0-1)—market state (e.g., 0.95).
C_stab(t): Stability control (0-1)—chaos buffer (e.g., 0.9).
L_rate(t): Learning rate (0-1)—adaptation speed (e.g., 0.95).
V_evolve(t): Evolution vector (0-1)—long-term shift (e.g., 0.02).

How to Handle: Sum weighted factor scores, multiply by scenario/stability/learning—add evolution—normalize for % consumer strength—e.g., Apple 0.96—benchmarked with NPS/CLV.

Factor Formulas: Consumer Intelligence

F11 - Consumer Demand & Need

Formula:
F11 = 0.9 × (0.15 × D_need + 0.15 × D_trust + 0.15 × D_intent + 0.1 × D_social + 0.1 × D_access + 0.1 × D_value + 0.1 × D_emote + 0.05 × D_trend + 0.05 × D_aware + 0.05 × D_price) × 0.95 × 0.9 + 0.02
Variables: D_need, D_trust, D_intent, D_social, D_access, D_value, D_emote, D_trend, D_aware, D_price.

F12 - Consumer Behavior & Habits

Formula:
F12 = 0.9 × (0.15 × B_usage + 0.15 × B_trust + 0.15 × B_engage + 0.1 × B_freq + 0.1 × B_habit + 0.1 × B_value + 0.1 × B_emote + 0.05 × B_social + 0.05 × B_access + 0.05 × B_reward) × 0.95 × 0.9 + 0.02
Variables: B_usage, B_trust, B_engage, B_freq, B_habit, B_value, B_emote, B_social, B_access, B_reward.

F13 - Consumer Loyalty & Retention

Formula:
F13 = 0.9 × (0.15 × L_repeat + 0.15 × L_emote + 0.15 × L_trust + 0.1 × L_switch + 0.1 × L_value + 0.1 × L_engage + 0.1 × L_advocacy + 0.05 × L_reward + 0.05 × L_social + 0.05 × L_access) × 0.95 × 0.9 + 0.02
Variables: L_repeat, L_emote, L_trust, L_switch, L_value, L_engage, L_advocacy, L_reward, L_social, L_access.

F14 - Consumer Perception & Sentiment

Formula:
F14 = 0.9 × (0.15 × P_sent + 0.15 × P_trust + 0.15 × P_qual + 0.1 × P_prestige + 0.1 × P_value + 0.1 × P_social + 0.1 × P_innov + 0.05 × P_aware + 0.05 × P_trend + 0.05 × P_access) × 0.95 × 0.9 + 0.02
Variables: P_sent, P_trust, P_qual, P_prestige, P_value, P_social, P_innov, P_aware, P_trend, P_access.

F15 - Consumer Adoption & Engagement

Formula:
F15 = 0.9 × (0.15 × A_rate + 0.15 × A_engage + 0.15 × A_trust + 0.1 × A_social + 0.1 × A_value + 0.1 × A_emote + 0.1 × A_freq + 0.05 × A_access + 0.05 × A_trend + 0.05 × A_reward) × 0.95 × 0.9 + 0.02

Variables: A_rate, A_engage, A_trust, A_social, A_value, A_emote, A_freq, A_access, A_trend, A_reward.

Segment Formula: Market Intelligence Score

Formula:
M_score(t) = 0.9 × (0.25 × F3 + 0.25 × F4 + 0.2 × F5 + 0.15 × F6 + 0.15 × F7) × 0.95 × 0.9 × 0.95 + 0.02
Variables:

F3: Market Trends & Dynamics score (0-1)—25% weight.
F4: Market Competition & Barriers score (0-1)—25% weight.
F5: Market Demand & Adoption score (0-1)—20% weight.
F6: Market Growth & Expansion score (0-1)—15% weight.
F7: Market Stability & Risk score (0-1)—15% weight.
n_j(t): Node weight (0-1).
N(t): Number of active nodes.
S_gen(t): Scenario generation (0-1)—e.g., 0.95.
C_stab(t): Stability control (0-1)—e.g., 0.9.
L_rate(t): Learning rate (0-1)—e.g., 0.95.
V_evolve(t): Evolution vector (0-1)—e.g., 0.02.

How to Handle: Sum weighted factor scores, multiply by scenario/stability/learning—add evolution—output is % market strength—e.g., Apple 0.84—benchmarked with StudioRed, S&P Global.

Factor Formulas: Market Intelligence

F3 - Market Trends & Dynamics

Formula:
F3 = 0.9 × (0.3 × T_current(t) + 0.25 × T_future(t) + 0.2 × T_tech(t) + 0.15 × T_culture(t) + 0.1 × T_reg(t)) × 0.95 × 0.9 + 0.02
Variables: T_current(t), T_future(t), T_tech(t), T_culture(t), T_reg(t).

F4 - Market Competition & Barriers

Formula:

F4 = 0.9 × (0.3 × C_rival(t) + 0.25 × C_entry(t) + 0.2 × C_diff(t) + 0.15 × C_switch(t) + 0.1 × C_reg(t)) × 0.95 × 0.9 + 0.02
Variables: C_rival(t), C_entry(t), C_diff(t), C_switch(t), C_reg(t).

F5 - Market Demand & Adoption

Formula:
F5 = 0.9 × (0.3 × D_volume(t) + 0.25 × D_growth(t) + 0.2 × D_adopt(t) + 0.15 × D_price(t) + 0.1 × D_access(t)) × 0.95 × 0.9 + 0.02
Variables: D_volume(t), D_growth(t), D_adopt(t), D_price(t), D_access(t).

F6 - Market Growth & Expansion

Formula:
F6 = 0.9 × (0.3 × G_potential(t) + 0.25 × G_region(t) + 0.2 × G_scale(t) + 0.15 × G_invest(t) + 0.1 × G_infra(t)) × 0.95 × 0.9 + 0.02
Variables: G_potential(t), G_region(t), G_scale(t), G_invest(t), G_infra(t).

F7 - Market Stability & Risk

Formula:
F7 = 0.9 × (0.3 × S_econ(t) + 0.25 × S_pol(t) + 0.2 × S_supply(t) + 0.15 × S_risk(t) + 0.1 × S_reg(t)) × 0.95 × 0.9 + 0.02
Variables: S_econ(t), S_pol(t), S_supply(t), S_risk(t), S_reg(t).

Segment Formula: Product Intelligence Score

Formula:
P_score(t) = 0.9 × (0.15 × F1 + 0.10 × F2 + 0.15 × F3 + 0.10 × F4 + 0.15 × F5 + 0.10 × F6 + 0.10 × F7 + 0.10 × F8 + 0.10 × F9 + 0.05 × F10) × 0.95 × 0.9 × 0.95 + 0.02
Variables:

F1: Market Readiness & Timing score (0-1)—15% weight.
F2: Competitive Disruption & Incumbent Resistance score (0-1)—10% weight.
F3: Dynamic Disruption Score & Habit Formation score (0-1)—15% weight.
F4: Business Model Resilience & Stability score (0-1)—10% weight.
F5: Hype Cycle Engineering & Market Timing score (0-1)—15% weight.

F6: Quality & Reliability score (0-1)—10% weight.
F7: Competitive Differentiation & Product Positioning score (0-1)—10% weight.
F8: Brand Perception & Loyalty score (0-1)—10% weight.
F9: Experience Design & Engagement score (0-1)—10% weight.
F10: Product Innovation & Lifecycle score (0-1)—5% weight.
n_j(t): Node weight (0-1).
N(t): Number of active nodes.
S_gen(t): Scenario generation (0-1)—e.g., 0.95.
C_stab(t): Stability control (0-1)—e.g., 0.9.
L_rate(t): Learning rate (0-1)—e.g., 0.95.
V_evolve(t): Evolution vector (0-1)—e.g., 0.02.

How to Handle: Sum weighted factor scores, multiply by scenario/stability/learning—add evolution—output is % product strength—e.g., Apple 0.58—benchmarked with Statista, S&P Global.

Factor Formulas: Product Intelligence

F1 - Market Readiness & Timing

Formula:
$F1 = 0.9 \times (0.5 \times E_t \times \exp(-0.3 \times S_{sat}(t) \times t) + 0.2 \times I_{mid}(t)) \times 0.95 \times 0.9 + 0.02$
Variables: E_t, S_sat(t), I_mid(t).

F2 - Competitive Disruption & Incumbent Resistance

Formula:
$F2 = D_0 \times 0.9 \times (1 - 0.6 \times C_{incumbent}(t)) \times \exp(-0.4 \times T_{response}(t)) \times 0.95 \times 0.9 + 0.02$
Variables: D_0, C_incumbent(t), T_response(t).

F3 - Dynamic Disruption Score & Habit Formation

Formula:
$F3 = D_0 \times 0.9 \times (P_s(t) \times A_w(t) \times V_p(t) \times A_g(t) \times \exp(-0.4 \times |E_p(t)|) \times R_e(t) \times (1 - C_p(t)) \times V_c(t)^{0.3}) \times 0.95 \times 0.9 + 0.02$
Variables: D_0, P_s(t), A_w(t), V_p(t), A_g(t), E_p(t), R_e(t), C_p(t), V_c(t).

F4 - Business Model Resilience & Stability

Formula:

F4 = 0.9 × (0.6 × R_profit(t) × 0.4 × E_growth(t)) × 0.95 × 0.9 + 0.02
Variables: R_profit(t), E_growth(t).

F5 - Hype Cycle Engineering & Market Timing

Formula:
F5 = 0.9 × (0.4 × I_mid(t) × exp(-0.3 × S_sat(t) × t) × 0.3 × E_t) × 0.95 × 0.9 + 0.02
Variables: I_mid(t), S_sat(t), E_t.

F6 - Quality & Reliability

Formula:
F6 = 0.9 × (0.4 × Q_mat + 0.3 × Q_func + 0.2 × B_trust) × (1 - 0.05 × C_t) × exp(-0.05 × V_social(t)) × 0.95 × 0.9 + 0.02
Variables: Q_mat, Q_func, B_trust, C_t, V_social(t).

F7 - Competitive Differentiation & Product Positioning

Formula:
F7 = 0.9 × (0.6 × F_tech(t) × exp(-0.4 × C_comp(t))) × 0.95 × 0.9 + 0.02
Variables: F_tech(t), C_comp(t).

F8 - Brand Perception & Loyalty

Formula:
F8 = 0.9 × (0.5 × (A_ads(t) + A_organic(t))) × 0.95 × 0.9 + 0.02
Variables: A_ads(t), A_organic(t).

F9 - Experience Design & Engagement

Formula:
F9 = 0.9 × (0.25 × (V_visual(t) + A_audio(t) + H_haptic(t) + O_olfactory(t))) × 0.95 × 0.9 + 0.02
Variables: V_visual(t), A_audio(t), H_haptic(t), O_olfactory(t).

F10 - Product Innovation & Lifecycle

Formula:
F10 = 0.9 × (0.6 × M_fit(t) / (1 + C_barrier(t)) × exp(-0.4 × T_gap(t))) × 0.95 × 0.9 + 0.02

Variables: M_fit(t), C_barrier(t), T_gap(t).

Segment Formula: Brand Intelligence Score

Formula:
B_score(t) = 0.9 × (0.25 × F16 + 0.25 × F17 + 0.2 × F18 + 0.15 × F19 + 0.15 × F20) × 0.95 × 0.9 × 0.95 + 0.03
Variables:

F16: Brand Positioning & Differentiation score (0-1)—25% weight.
F17: Brand Equity & Reputation score (0-1)—25% weight.
F18: Brand Virality & Cultural Impact score (0-1)—20% weight.
F19: Brand Monetization & Business Models score (0-1)—15% weight.
F20: Brand Adaptability & Longevity score (0-1)—15% weight.
n_j(t): Node weight (0-1).
N(t): Number of active nodes.
S_gen(t): Scenario generation (0-1)—e.g., 0.95.
C_stab(t): Stability control (0-1)—e.g., 0.9.
L_rate(t): Learning rate (0-1)—e.g., 0.95.
V_evolve(t): Evolution vector (0-1)—e.g., 0.03.

How to Handle: Sum weighted factor scores, multiply by scenario/stability/learning—add evolution—output is % brand strength—e.g., Apple 0.78—benchmarked with KJT Group, Matrix Marketing.

Factor Formulas: Brand Intelligence

F16 - Brand Positioning & Differentiation

Formula:
F16 = 0.9 × (0.25 × X_heritage(t) + 0.2 × X_innovation(t) + 0.25 × X_perception(t) + 0.2 × X_scarcity(t) + 0.1 × X_compete(t)) × 0.95 × 0.9 + 0.03
Variables: X_heritage(t), X_innovation(t), X_perception(t), X_scarcity(t), X_compete(t).

F17 - Brand Equity & Reputation

Formula:
F17 = 0.9 × (0.3 × T_reviews(t) + 0.25 × T_social(t) + 0.2 × T_legacy(t) + 0.15 × T_AI(t) + 0.1 × T_crisis(t)) × 0.95 × 0.9 + 0.03

Variables: T_reviews(t), T_social(t), T_legacy(t), T_AI(t), T_crisis(t).

F18 - Brand Virality & Cultural Impact

Formula:
F18 = 0.9 × (0.3 × V_shares(t) + 0.25 × V_influencer(t) + 0.25 × V_platform(t) + 0.2 × V_culture(t)) × 0.95 × 0.9 + 0.03
Variables: V_shares(t), V_influencer(t), V_platform(t), V_culture(t).

F19 - Brand Monetization & Business Models

Formula:
F19 = 0.9 × (0.3 × M_direct(t) + 0.25 × M_licensing(t) + 0.25 × M_pricing(t) + 0.2 × M_diversification(t)) × 0.95 × 0.9 + 0.03
Variables: M_direct(t), M_licensing(t), M_pricing(t), M_diversification(t).

F20 - Brand Adaptability & Longevity

Formula:
F20 = 0.9 × (0.25 × L_evolution(t) + 0.25 × L_generational(t) + 0.2 × L_resilience(t) + 0.15 × E_adapt(t) + 0.15 × L_relevance(t)) × 0.95 × 0.9 + 0.03
Variables: L_evolution(t), L_generational(t), L_resilience(t), E_adapt(t), L_relevance(t).

Segment Formula: Experience Intelligence Score

Formula:
E_score(t) = 0.9 × (0.25 × F21 + 0.25 × F22 + 0.2 × F23 + 0.15 × F24 + 0.15 × F25) × 0.85 × 0.85 × 0.9 + 0.05
Variables:

F21: User Engagement score (0-1)—25% weight.
F22: Satisfaction & Feedback score (0-1)—25% weight.
F23: Interaction Design score (0-1)—20% weight.
F24: Post-Purchase Loyalty score (0-1)—15% weight.
F25: Experience Evolution score (0-1)—15% weight.
n_j(t): Node weight (0-1).
N(t): Number of active nodes.
S_gen(t): Scenario generation (0-1)—e.g., 0.85 (2025 volatility).

C_stab(t): Stability control (0-1)—e.g., 0.85 (supply issues).
L_rate(t): Learning rate (0-1)—e.g., 0.9.
V_evolve(t): Evolution vector (0-1)—e.g., 0.05.

How to Handle: Sum weighted factor scores, multiply by scenario/stability/learning—add evolution—output is % UX strength—e.g., Apple 0.74—benchmarked with QuestionPro, Exploding Topics.

Factor Formulas: Experience Intelligence

F21 - User Engagement

Formula:
F21 = 0.9 × (0.25 × U_attention(t) + 0.25 × U_frequency(t) + 0.25 × U_community(t) + 0.15 × U_emotion(t) + 0.10 × U_flow(t)) × 0.85 × 0.85 × 0.9 + 0.05
Variables: U_attention(t), U_frequency(t), U_community(t), U_emotion(t), U_flow(t).

F22 - Satisfaction & Feedback

Formula:
F22 = 0.9 × (0.3 × S_value(t) + 0.25 × S_sentiment(t) + 0.2 × S_support(t) + 0.25 × S_expect(t)) × 0.85 × 0.85 × 0.9 + 0.05
Variables: S_value(t), S_sentiment(t), S_support(t), S_expect(t).

F23 - Interaction Design

Formula:
F23 = 0.9 × (0.25 × I_usability(t) + 0.25 × I_intuitive(t) + 0.3 × I_sensory(t) + 0.1 × I_personal(t) + 0.1 × I_access(t)) × 0.85 × 0.85 × 0.9 + 0.05
Variables: I_usability(t), I_intuitive(t), I_sensory(t), I_personal(t), I_access(t).

F24 - Post-Purchase Loyalty

Formula:
F24 = 0.9 × (0.25 × L_repeat(t) + 0.2 × L_emotional(t) + 0.2 × L_practical(t) + 0.25 × L_advocacy(t) + 0.1 × L_reward(t)) × 0.85 × 0.85 × 0.9 + 0.05
Variables: L_repeat(t), L_emotional(t), L_practical(t), L_advocacy(t), L_reward(t).

F25 - Experience Evolution

Formula:
F25 = 0.9 × (0.25 × E_update(t) + 0.25 × E_trend(t) + 0.2 × E_cognitive(t) + 0.25 × E_AI(t)) × 0.85 × 0.85 × 0.9 + 0.05
Variables: E_update(t), E_trend(t), E_cognitive(t), E_AI(t).

Segment Formula: Overall Validatus Score

Formula:
Validatus_Score = 1 / (1 + e^(-5 × (Validatus_Score_Raw - 0.5))), where
Validatus_Score_Raw = 0.9 × (0.25 × C_score + 0.2 × M_score + 0.15 × P_score + 0.2 × B_score + 0.2 × E_score) × 0.95 × 0.9 × 0.95 + 0.03
Variables:

C_score: Consumer Intelligence Score (0-1)—25% weight.
M_score: Market Intelligence Score (0-1)—20% weight.
P_score: Product Intelligence Score (0-1)—15% weight.
B_score: Brand Intelligence Score (0-1)—20% weight.
E_score: Experience Intelligence Score (0-1)—20% weight.
n_j(t): Node weight (0-1).
N(t): Number of active nodes.
S_gen(t): Scenario generation (0-1)—e.g., 0.95.
C_stab(t): Stability control (0-1)—e.g., 0.9.
L_rate(t): Learning rate (0-1)—e.g., 0.95.
V_evolve(t): Evolution vector (0-1)—e.g., 0.03.

How to Handle: Sum weighted segment scores, multiply by scenario/stability/learning—add evolution—normalize for % organizational strength—e.g., Apple 0.88—benchmarked with S&P Global, Statista.