👑 Sultan Pro v6 Tuning Guide & Algorithm Whitepaper

This manual is designed to help Product Managers and Strategy teams understand the underlying logic of the **Sultan Pro Calculator v6** and provide tuning strategies for different business objectives.

Part 1: Core Parameter Tuning (The "Knobs")

1. Traffic & Supply

- Senders (Participants)
  - **Definition**: The number of users who successfully send at least one red packet link.
  - **Benchmark**: 1%~5% of Monthly Active Users (MAU). The default **1.0M** is a moderately optimistic starting point for a major campaign.
  - **Impact**: Directly scales the **Total Budget** and **Total Reach**. Linear relationship.
- Avg Referrals / Sender
  - **Definition**: The average number of **successful claims** generated by each sender.
  - **Benchmark**: **3.0 ~ 5.0**. Due to the "Reward for every 3 friends" milestone design, users are incentivized to hit multiples of 3.
  - **Note**: Avoid setting this too high (>8) unless the reward per claim is extremely lucrative or the mechanism has high viral coefficient.

2. Receiver Mix & Frequency (The Leverage Point)

This is the most critical area for controlling ROI.

- Existing User Frequency (Claims per User)
  - **Definition**: On average, how many red packets will a single **Existing Active User** claim during the entire campaign?
  - **Logic**: Active users exist in multiple social groups. If unchecked, they become a "budget black hole," claiming packets from multiple senders.
  - **Tuning Strategy**:
    - **Default 10x**: Simulates realistic social behavior (mutual farming among existing users).
    - **If CPIMAU is too high**: **Lower this parameter** (e.g., to 3x), or implement product rules like "Limit 1 claim per user per day."
- Population Mix %
  - **Existing**: Users already active. Typically **60%-80%**.
  - **New Active**: Low-activity or mildly churned users. Typically **15%-25%**.
  - **RA (Re-Activated)**: Deeply dormant users (e.g., inactive >30 days). Typically **5%-15%**.

- **New (Pure New)**: Fresh registrations. Typically **1%-5%**.
- **Note**: The calculator automatically normalizes these inputs, so you just need to enter relative proportions.

3. Sultan Boost (Tier Strength)

- **Definition**: Simulates wealth inequality. VIP users send bigger packets and have wider reach.
- **Impact**:
  - A higher coefficient (e.g., 2.0x) implies traffic is heavily concentrated among top-tier VIPs.
  - This **increases Total Cost**, as red packets sent by VIPs carry a higher payout multiplier for the receiver (The "Sultan Boost" effect).

Part 2: Scenario Playbook

Scenario A: "CPIMAU is too high ($1.50+). We need to cut costs."

Diagnosis: **Existing Users** are likely consuming too much of the budget. **Action Plan**:

1. **Lower Existing Frequency**: Drag `Existing User Freq` from 10 down to **3**.
   - *Logic*: Limit the ability of old users to farm rewards; save the supply for new users.
2. **Slash Existing Rewards**: Drop `Existing Reward` from Rp 200 to **Rp 50-100**.
   - *Logic*: Existing users click for social reasons/fun, not just for Rp 200. A token amount is sufficient.
3. **Boost Incremental Mix**: Use operational tactics (e.g., "Double rewards for dormant friends") to shift the `RA` and `New` mix percentage higher.

Scenario B: "Volume is too low. We need more MAU."

Diagnosis: Total Reach is insufficient, or conversion from reach to active is too low. **Action Plan**:

1. **Increase Senders**: Push more in-app visibility (Pop-ups/Banners) to drive `Senders` to **3M+**.
2. **Raise Avg Referrals**: Optimize the Milestone design. Set `Milestone Step` to 3 and increase the `Base Reward` to incentivize users to complete the "Set of 3".
3. **Increase Incremental Rewards**: Raise `RA Reward` from Rp 10k to **Rp 15k**. High rewards drive higher click-through rates for dormant users.

Scenario C: "CAC is scary ($10+). Is this sustainable?"

Diagnosis: This is expected. The budget is primarily spent on **MAU Resurrection**, not just pure User Acquisition. **Action Plan**:

1. **Reframe the Metric**: Explain that the primary goal is **MAU**, not New Users.

2. **Optimize Conversion**: Improve `CVR (New)` by offering "No-min-spend Vouchers" instead of cash to new users, ensuring the first purchase happens.

Part 3: Underlying Algorithm & Formula Derivation

This section details the exact math running in the backend of the calculator for Finance/Data team validation.

1. Supply Side: Total Packet Pool

$$\text{Total Claims (Supply)} = \text{Senders} \times \text{Avg Referrals}$$

- *Example: 1M Senders × 4.5 Avg = 4.5M Total Claims Available.*

2. Demand Side: Unique User Derivation (The Core Logic)

This is the most important algorithm: **Deriving unique users based on frequency.**

First, calculate the **Weighted Average Frequency**:

$$\text{Avg Freq} = (\%_{\text{Exist}} \times \text{Freq}_{\text{Exist}}) + (\%_{\text{Others}} \times 1)$$

- *Note: Incremental users (New/RA) are forced to Frequency = 1, as they become "Existing" immediately after the first claim.*

Next, derive **Total Unique Receivers**:

$$\text{Total Unique Users} = \frac{\text{Total Claims}}{\text{Avg Freq}}$$

Finally, calculate **Incremental Users**:

$$\text{Inc. MAU} = \text{Total Unique Users} \times (\%_{\text{NewMAU}} + \%_{\text{RA}} + \%_{\text{New}})$$

$$\text{Inc. New Users} = \text{Total Unique Users} \times \%_{\text{New}}$$

3. The "Sultan Multiplier" (Weighted Average)

Why does the calculator use a ~1.13x multiplier instead of a simple average? Because **High-tier users (VIPs) generate significantly more packet volume** than low-tier users. The cost is weighted by **Traffic Volume**, not Population.

The Formula:

$$\text{Multiplier} = \sum(\text{Tier Multiplier} \times \text{Traffic Volume Share \%})$$

Standard Distribution Logic:

Tier	Population %	Reward Boost	Traffic Share (Vol)	Contribution
T1 (Sultan)	Top 5%	1.5x	32%	0.48
T2 (Top)	Next 10%	1.2x	23%	0.28
T3 (Mid)	Next 15%	1.0x	20%	0.20
T4 (Low)	Next 20%	0.8x	15%	0.12
T5 (Bottom)	Bottom 50%	0.5x	10%	0.05
Total	100%	-	100%	~1.13x

4. Cost Structure

A. Receiver Payout:

$$\text{Cost}_{\text{Rec}} = \sum(\text{Claims}_{\text{Segment}} \times \text{Reward}_{\text{Segment}}) \times \text{Sultan Boost}$$

B. Sender Incentive (Milestone Logic):

$$\text{Milestones Hit} = \lfloor \frac{\text{Avg Referrals}}{\text{Step}} \rfloor$$

$$\text{Payout Per Sender} = \sum_{i=0}^{n}(\text{Base} + i \times \text{Inc})$$

$$\text{Cost}_{\text{Send}} = \text{Senders} \times \text{Payout Per Sender} \times \text{Sultan Boost}$$

C. Ops Cost (Operational Costs):

This is a **fixed constant** (set to 200,000,000 IDR in the model) added to the final budget. It covers:

1. **Leaderboard Prizes**: High-value items (iPhones, Gold) for top sharers.
2. **Marketing Buzz**: Initial seeding budget for influencers/KOLs.
3. **Risk Buffer**: Operational safety margin.

D. Total Budget:

$$\text{Total Cost} = \text{Cost}_{\text{Rec}} + \text{Cost}_{\text{Send}} + \text{Ops Cost}$$

5. Key Performance Indicators (KPIs)

- CPIMAU (Cost Per Incremental MAU):

$$\frac{\text{Total Cost (USD)}}{\text{Inc. MAU}}$$

Denominator excludes Existing Active Users. Only counts growth.

- CPIB (Cost Per Incremental Buyer):

$$\frac{\text{Total Cost (USD)}}{\text{Inc. MAU} \times \text{Weighted CVR}}$$

Measures efficiency in driving GMV.

- CAC (Cost Per New User):

$$\frac{\text{Total Cost (USD)}}{\text{Inc. New Users}}$$

The cost to acquire a purely new registration.