SOG Tracker - Advanced Analytics User Guide

Understanding Your Performance Metrics

A comprehensive guide to the calculations, math, and methodology behind SOG Tracker's advanced analytics features

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My Rankings (Percentiles)

What Are Percentiles?

A percentile tells you what percentage of SOG members you're performing better than. For example:

- **75th percentile** = You're performing better than 75% of companies

- **50th percentile** = You're performing better than 50% of companies (median)

- **25th percentile** = You're performing better than 25% of companies

How Percentiles Are Calculated

Step 1: Data Collection

For a selected month and year, the system gathers data from all SOG member companies who have entered metrics for that period.

Step 2: Ranking Each Metric

For each performance metric, we:

1. Sort all companies from lowest to highest value

2. Find where your company falls in that sorted list

3. Calculate your percentile using this formula:

```

Percentile = (Number of companies below you / Total companies) × 100

```

Example:

- 10 companies total

- Your Gross Profit Margin: 45%

- 7 companies have lower GPM than you

- Your percentile: (7 / 10) × 100 = **70th percentile**

Step 3: Overall Performance Score

Your overall percentile is the **average** of all individual metric percentiles:

```
Overall Percentile = Sum of all metric percentiles / Number of metrics
```

Example:

- Gross Profit Margin: 70th percentile

- Labor Utilization: 80th percentile

- Operating Expense Ratio: 60th percentile

- Cash Reserves: 75th percentile

- Overall: (70 + 80 + 60 + 75) / 4 = **71.25th percentile**

Badge System

Rankings are color-coded for quick understanding:

Percentile Range	Badge	Color	What It Means
90-100%	🏆 Top 10%	Gold	Outstanding performance
75-89%	⭐ Top 25%	Green	Strong performance
50-74%	👍 Above Average	Blue	Solid performance
25-49%	📊 Below Average	Orange	Room for improvement
0-24%	⚠️ Bottom 25%	Red	Needs attention

Metrics Included in Rankings

1. **Gross Profit Margin %** - Higher is better

2. **GP per Billed Hour** - Higher is better

3. **Labor Utilization %** - Higher is better

4. **GP per Employee** - Higher is better

5. **Operating Expense Ratio %** - Lower is better

6. **Cash Reserves (months)** - Higher is better

7. **Recurring Revenue %** - Higher is better

Data Requirements

- **Minimum:** 2 companies must have data for the same month/year

- **Ideal:** 5+ companies for meaningful comparison

- **Anonymous:** You never see other companies' specific values, only your ranking

Important Notes

⚠️ **What Rankings Don't Tell You:**

- Rankings are **relative** to your peer group, not absolute standards

- A high ranking doesn't mean you're profitable if everyone is struggling

- A low ranking might still be good if the entire group is performing well

- Rankings fluctuate as companies enter data - check back regularly

✅ **Best Use:**

- Identify areas where you excel vs. areas needing improvement

- Track your ranking changes over time

- Compare yourself to SOG recommended benchmarks

Goals & Progress

What Are Goals?

Goals allow you to set performance targets and track your progress toward achieving them. There are two types:

1. **Company Goals** - Targets you set for your own company

2. **SOG Recommended Benchmarks** - Industry best practices set by SOG administrators

How Progress Is Calculated

Step 1: Current Value

The system uses your **most recent month's data** for the selected year to calculate your current performance.

Step 2: Progress Percentage

```

Progress % = (Current Value / Target Value) × 100

```

Example:

- Goal: Gross Profit Margin of 50%

- Your current GPM: 45%

- Progress: (45 / 50) × 100 = **90% of goal**

Step 3: Status Indicators

Goals are color-coded based on progress:

Progress	Emoji	Color	Status
≥100%	✅	Green	Goal Achieved
75-99%	🟢	Light Green	On Track
50-74%	🟡	Yellow	Needs Attention
<50%	🔴	Red	Off Track

Goal Types

Monthly Goals:

- Target for a specific month

- Example: "Achieve 48% GPM in March"

- Progress measured against that single month

Quarterly Goals:

- Target for a 3-month period

- Example: "Achieve 50% GPM in Q2"

- Progress measured against the average of those 3 months

Annual Goals:

- Target for the entire year

- Example: "Achieve 52% GPM for 2026"

- Progress measured against year-to-date average

SOG Recommended Benchmarks

SOG administrators set these based on:

- Industry best practices

- Historical SOG member performance

- Market conditions

- Company size considerations

Difference Calculation:
```
Difference = Your Value - SOG Target
```

- **Positive difference** = You're exceeding the benchmark ✅

- **Negative difference** = You're below the benchmark ⚠️

Example:

- Your GPM: 47%

- SOG Target: 45%

- Difference: +2% (You're beating the benchmark!)

Best Practices for Setting Goals

1. **Start with SOG benchmarks** as a baseline

2. **Be realistic** - stretch goals are good, but should be achievable

3. **Track monthly** - adjust goals based on performance trends

4. **Review quarterly** - reassess targets as business conditions change

5. **Set goals for 3-5 key metrics** - don't overwhelm yourself

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Forecasting

What Is Forecasting?

Forecasting uses **linear regression** (a statistical method) to predict future performance based on your historical trends. It shows where your metrics are likely headed if current patterns continue.

The Math Behind Forecasting

Linear Regression Formula

The forecast is based on the equation of a line:

```

```
y = mx + b
```

Where:

- y = predicted value

- x = time point (month number)

- m = slope (rate of change)

- b = intercept (starting value)

```

Step 1: Gather Historical Data

The system collects all your historical data for the selected metric:
- Minimum: 3 months
- Recommended: 6+ months
- Better predictions: 12+ months

Step 2: Calculate the Slope (m)

The slope tells us how fast your metric is changing over time:

$$m = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{n(\Sigma x^2) - (\Sigma x)^2}$$

Where:

- n = number of data points

- Σxy = sum of (month × value)

- Σx = sum of months

- Σy = sum of values

- Σx^2 = sum of squared months

```
```

What the slope means:

- **Positive slope** = Metric is improving over time ↗

- **Negative slope** = Metric is declining over time ↘

- **Zero slope** = Metric is stable →

Step 3: Calculate the Intercept (b)

```
   Σy - m(Σx)
b = ——————————
       n
```

The intercept is the theoretical starting point of your trend line.

Step 4: Generate Predictions

For each future month, we calculate:

```
Predicted Value = m × (future month number) + b
```

Example:

You have 6 months of GPM data:

- Month 1: 42%

- Month 2: 44%

- Month 3: 43%

- Month 4: 46%

- Month 5: 45%

- Month 6: 47%

After calculations:

- Slope (m) = 0.8 (improving by 0.8% per month)

- Intercept (b) = 41

Prediction for Month 7:

```
Predicted GPM = 0.8 × 7 + 41 = 46.6%
```

Prediction for Month 9:

```
Predicted GPM = 0.8 × 9 + 41 = 48.2%
```

Confidence Intervals (95% Confidence Bands)

Forecasts aren't perfect - there's always some uncertainty. We show this with **confidence bands**.

What Is a 95% Confidence Interval?

It means: "We're 95% confident the actual value will fall within this range."

Formula:
```
Margin of Error = 1.96 × Standard Error × $\sqrt{(1 + 1/n + distance^2)}$
```

Where:

- 1.96 = statistical constant for 95% confidence

- Standard Error = measure of how much data varies from the line

- n = number of historical data points

- distance = how far into the future we're predicting
```

**Upper Bound:**
```
Upper Bound = Predicted Value + Margin of Error
```

**Lower Bound:**

```

Lower Bound = Predicted Value - Margin of Error

```


**Example:**

- Predicted GPM for Month 9: 48.2%

- Margin of Error: ±3.5%

- **Range: 44.7% to 51.7%**

- This means: "We're 95% confident your actual GPM will be between 44.7% and 51.7%"


⚠️ **Important:** Confidence bands **widen** as you predict further into the future because uncertainty increases.


### R-Squared ($R^2$): How Good Is the Forecast?

R-squared measures how well the trend line fits your data:

```

R² = 1 - (Sum of Squared Residuals / Total Sum of Squares)

```


**Interpreting $R^2$:**

| $R^2$ Value | Strength | What It Means |
|----------|----------|---------------|

| 0.70 - 1.00 | Strong | Excellent predictive power - high confidence |

| 0.40 - 0.69 | Moderate | Reasonable predictions - medium confidence |

| 0.00 - 0.39 | Weak | Poor fit - low confidence, more data needed |

**Example:**

- $R^2$ = 0.85 → "85% of the variation in your data is explained by the trend"

- This is a **strong trend** - predictions are reliable

### Trend Characteristics

#### Direction

- **Increasing** → Slope > 0.01 (metric improving)

- **Decreasing** → Slope < -0.01 (metric declining)

- **Stable** → Slope between -0.01 and 0.01 (metric flat)

#### Strength

- **Strong** → $R^2$ > 0.7 (high confidence)

- **Moderate** → $R^2$ between 0.4 and 0.7 (medium confidence)

- **Weak** → $R^2$ < 0.4 (low confidence, need more data)

### Forecast Insights

The system automatically analyzes your forecast and provides:

#### 1. Projected Change

How much the metric is expected to change from now to the end of the forecast period.

```
Change = Last Forecast Value - Current Value

Change % = (Change / Current Value) × 100
```

#### 2. Average Forecast vs Historical Average

Compares your predicted future performance to your past performance.

```
Avg Historical = Sum of past values / Number of past months

Avg Forecast = Sum of predicted values / Number of forecast months
```

3. Risk Assessment

Based on trend direction and strength:

Assessment	When It Shows	What It Means
✅ Positive Outlook	Increasing + Strong	Things are improving with confidence
ℹ️ Stable	Stable + Any strength	Performance is consistent
⚠️ Low Confidence	Any direction + Weak	Need more data for reliable predictions
🚨 Attention Needed	Decreasing + Strong	Clear downward trend - take action

Automated Recommendations

The system provides specific recommendations based on:

Trend Direction:

- **Decreasing trends** → Review operations, compare to benchmarks

- **Increasing trends** → Continue strategies, set stretch goals

- **Stable trends** → Monitor for changes, seek improvement opportunities

Trend Strength:

- **Weak trends ($R^2 < 0.4$)** → Enter more data, wait 3-6 months

- **Strong trends ($R^2 > 0.7$)** → Use for strategic planning

Metric-Specific:

- **Gross Profit Margin** → Review pricing and costs

- **Labor Utilization** → Analyze staffing and project allocation

- **Cash Reserves** → Ensure operational stability

Data Requirements for Accurate Forecasting

Data Points	Forecast Quality	Recommendation
3-5 months	Minimal	Predictions unreliable - get more data
6-8 months	Good	Reasonable short-term predictions
9-12 months	Better	Reliable medium-term predictions
12+ months	Best	High confidence long-term predictions

Important Limitations

⚠️ **Forecasting Assumes:**

1. **Past patterns continue** - major changes invalidate predictions

2. **Linear trends** - doesn't account for seasonal variations

3. **No external shocks** - economic changes, new competitors, etc.

4. **Stable business model** - major pivots require new forecasts

✅ **Best For:**

- Identifying general trends (up/down/stable)

- Short-term planning (3-6 months)

- Spotting concerning patterns early

- Setting realistic goals

❌ **Not Reliable For:**

- Long-term strategic planning (>12 months)

- Businesses with high volatility

- New companies with limited history

- Markets with rapid changes

How to Use Each Feature

Using My Rankings

Step 1: Navigate to Analytics → My Rankings

Step 2: Select the month and year you want to analyze

- Choose periods where you've entered data

- Recent months give current performance snapshot

- Compare multiple months to track improvement

Step 3: Click "Load Rankings"

Step 4: Interpret your results:

- **Overall Percentile** - Your general performance vs peers

- **Individual Metrics** - Which areas are strengths vs weaknesses

- **Badge Colors** - Quick visual of performance level

Step 5: Take action:

- **Gold/Green badges (Top 25%)** - Document what you're doing right

- **Blue badges (Above Average)** - Good, but room for improvement

- **Orange/Red badges (Bottom 50%)** - Priority areas for improvement

Best Practice:

- Check rankings monthly after entering data

- Track changes in your percentiles over time

- Focus improvement efforts on your lowest-ranking metrics

Using Goals & Progress

Step 1: Navigate to Analytics → Goals & Progress

Step 2: Select the year and click "Load Goals"

Step 3: Review SOG Recommended Benchmarks

- See which benchmarks you're meeting (green) vs missing (red)

- Understand the gap between your performance and best practices

- Use these as a baseline for setting your own goals

Step 4: Set Company Goals

- Click "Add Company Goal"

- Select a metric you want to improve

- Set a realistic but challenging target value

- Choose monthly, quarterly, or annual period

- Click "Save Goal"

Step 5: Track Your Progress

- Monitor progress bars for each goal

- Green (>100%) = Goal achieved! 🎉

- Yellow (50-99%) = Making progress

- Red (<50%) = Need to accelerate efforts

Step 6: Adjust Goals as Needed

- Delete goals that are no longer relevant

- Add new goals as priorities change

- Revise targets based on performance trends

Best Practice:

- Start with 3-5 key metrics

- Make goals specific and time-bound

- Review progress weekly

- Celebrate achievements to motivate team

- Use forecasting to set realistic targets

Using Forecasting

Step 1: Navigate to Analytics → Forecasting

Step 2: Select which metric to forecast
- Choose metrics critical to your business

- Start with Gross Profit Margin (most important)

- Forecast one metric at a time for clarity

Step 3: Select forecast period
- **3 months** - Very short term, high accuracy

- **6 months** - Good balance of accuracy and planning horizon

- **12 months** - Long-term planning, wider confidence bands

- **18-24 months** - Strategic planning only, high uncertainty

Step 4: Click "Generate Forecast"

Step 5: Analyze the Results

A. Trend Summary:

- Direction (increasing/decreasing/stable)

- Strength (strong/moderate/weak)

- R^2 value (confidence in predictions)

B. The Chart:

- **Blue solid line** = Your historical data

- **Green dashed line** = Predicted future values

- **Light green shaded area** = 95% confidence band

- **Where lines meet** = Present day (transition from past to future)

C. Forecast Insights:

- **Projected Change** - How much the metric will change

- **Average Forecast** - Expected average performance

- **Risk Assessment** - Overall outlook and confidence

D. Recommendations:

- Specific actions based on your trend

- Data quality feedback

- Strategic guidance

Step 6: Use Insights for Planning

- **Strong increasing trend** → Continue current strategies

- **Strong decreasing trend** → Investigate and correct immediately

- **Weak trend** → Need more data before making decisions

- **Stable trend** → Maintain current performance or push for improvement

Step 7: Re-forecast Regularly

- Generate new forecasts monthly as you add data

- Compare new forecasts to old ones to track accuracy

- Adjust your strategies based on forecast changes

Best Practice:

- Forecast your top 3-4 metrics monthly

- Don't over-rely on forecasts >6 months out

- Combine forecasts with goals for realistic target-setting

- Use forecasts to catch problems early (declining trends)

- Celebrate when forecasts show improvement!

Best Practices

Data Entry Best Practices

For Accurate Analytics:

1. **Enter data consistently**

   - Same time each month (within 7 days of month-end)

   - Complete all required fields

   - Double-check numbers for accuracy

2. **Don't skip months**

   - Missing data creates gaps in forecasts

   - Makes rankings less reliable

   - Breaks trend analysis

3. **Use accurate data**

   - Pull from your accounting system

   - Don't estimate or round excessively

   - Be honest about performance

4. **Enter promptly**

   - Enter data as soon as month closes

   - Don't wait weeks - trends become stale

   - Rankings work best when all members enter timely data

Using Analytics Strategically

Monthly Routine:

Week 1: Enter previous month's data

Week 2: Check rankings - where do you stand?

Week 3: Review goal progress - on track?

Week 4: Generate forecasts - what's the trend?

Quarterly Deep Dive:

- Compare Q1 vs Q2 vs Q3 rankings

- Analyze which initiatives improved metrics

- Set new goals for next quarter

- Generate 6-month forecasts for planning

Annual Review:

- Track full year percentile trends

- Review goal achievement rate

- Use 12-month forecasts for strategic planning

- Set annual goals for next year

Interpreting Results

Don't Panic Over:

- Single month bad rankings (could be anomaly)

- Small percentile changes (±5-10%)

- Weak forecasts early on (need more data)

Do Pay Attention To:

- Consistent downward ranking trends (3+ months)

- Large percentile drops (>20%)

- Strong declining forecasts ($R^2 > 0.7$)

- Multiple metrics in red simultaneously

Take Action When:

- Rankings fall below 25th percentile

- Goals are <50% achieved at mid-period

- Forecasts predict performance dropping below profitability

- Multiple concerning signals align

Troubleshooting

My Rankings Issues

Problem: "Not enough companies have entered data"

- **Cause:** <2 companies have data for selected month

- **Solution:** Choose a different month or wait for others to enter data

Problem: "No data found for your company"

- **Cause:** You haven't entered data for that month

- **Solution:** Go to Dashboard and enter your metrics

Problem: All percentiles show 0%

- **Cause:** Only your company has data for that period

- **Solution:** Wait for other SOG members to enter data

Problem: Rankings seem wrong

- **Cause:** Data entry errors or calculation issues

- **Solution:** Verify your entered data is accurate, contact support if persistent

Goals Issues

Problem: Progress shows 0% but I have data

- **Cause:** No data entered for the goal's year

- **Solution:** Enter metrics for the current year

Problem: Can't delete a goal

- **Cause:** Permission issue or connection problem

- **Solution:** Refresh page and try again, ensure you're logged in

Problem: SOG benchmarks don't match my company size

- **Cause:** Benchmarks are averages across all SOG members

- **Solution:** Use company goals to set targets appropriate for your size

Forecasting Issues

Problem: "Need at least 3 months of data"

- **Cause:** Insufficient historical data

- **Solution:** Enter data for at least 3 consecutive months

Problem: Forecast shows "weak trend"

- **Cause:** High variability in your data or insufficient data points

- **Solution:** Enter more months of data (aim for 6+)

Problem: Confidence bands are very wide

- **Cause:** Normal for long-term forecasts or inconsistent data

- **Solution:** Use shorter forecast periods or get more historical data

Problem: Forecast predicts impossible values

- **Cause:** Extreme outliers in your data or insufficient data

- **Solution:** Review data for errors, delete outliers, add more months

Problem: Trend seems wrong

- **Cause:** Recent major business changes or data entry errors

- **Solution:** Verify all entered data is correct, forecasts work best with stable businesses

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Technical Notes

Calculation Frequency

- **Rankings:** Calculated in real-time when you click "Load Rankings"

- **Goals:** Progress calculated in real-time based on latest data

- **Forecasts:** Generated on-demand when you click "Generate Forecast"

Data Privacy

- **Rankings:** You never see other companies' actual values, only your position

- **Goals:** Your company goals are private, SOG benchmarks are shared

- **Forecasts:** Based only on your data, completely private

Rounding and Precision

- **Percentages:** Rounded to 1 decimal place (45.3%)

- **Currency:** Rounded to nearest dollar ($45,678)

- **Forecasts:** Shown to 2 decimal places for precision

- **Confidence Bands:** Shown as ± ranges

When Calculations Update

- **After entering data:** Immediately available for all features

- **After editing data:** Recalculates within seconds

- **After deleting data:** Removed from future calculations

- **Other companies' data:** Rankings update as others enter data

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Frequently Asked Questions

Q: Why do my rankings change when other companies enter data?

A: Rankings are relative - as more companies enter data, your position in the group can shift up or down.

Q: Can I see other companies' actual numbers?

A: No, rankings are anonymous. You only see your percentile position, not other companies' values.

Q: How accurate are the forecasts?

A: Accuracy depends on data quality and amount. Strong trends ($R^2 > 0.7$) with 6+ months of data are reasonably accurate for 3-6 months out.

Q: Should I make business decisions based on forecasts?

A: Use forecasts as one input among many. They show trends, not guarantees. Combine with other analysis.

Q: Why can't I forecast further than 24 months?

A: Uncertainty increases exponentially beyond 2 years. Predictions become unreliable.

Q: What if my forecast shows declining performance?

A: This is valuable early warning! Investigate causes immediately and take corrective action.

Q: Can I forecast multiple metrics at once?

A: Not simultaneously in the UI, but you can generate multiple forecasts sequentially. Focus on 3-4 key metrics.

Q: Why do SOG benchmarks seem high/low?

A: Benchmarks represent best practices across all SOG members. Your size, market, and business model may differ.

Q: How often should I check analytics?

A: Rankings and goals: weekly. Forecasts: monthly after entering new data.

Q: What's the minimum data needed for each feature?

- Rankings: 1 month of your data + 1 other company's data

- Goals: Just set a goal and enter current month's data

- Forecasting: Minimum 3 months, recommend 6+

Getting Help

Need Assistance?

- **SOG Administrator:** Contact Armando for questions about benchmarks and group data

- **Technical Support:** Use the support form in SOG Tracker

- **Your Company Admin:** Can help with data entry and goal setting

- **This Guide:** Reference formulas and examples anytime

Feedback Welcome:

We're constantly improving these analytics. If you have suggestions or find issues, please let us know!

Summary

Key Takeaways

1. **Rankings** show where you stand relative to peers (percentiles)

2. **Goals** help you set and track performance targets

3. **Forecasting** predicts future performance based on trends

The Math Simplified

- **Percentiles:** Your position in a sorted list (simple ranking)

- **Goals:** Current value ÷ Target value × 100

- **Forecasting:** y = mx + b (line fitting through your data points)

Success Strategy

1. **Enter data consistently** - quality in = quality out

2. **Check rankings monthly** - track your competitive position

3. **Set 3-5 key goals** - focus your improvement efforts

4. **Forecast quarterly** - plan ahead with trend data

5. **Take action** - analytics only help if you use insights

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SOG Tracker Advanced Analytics

Remember: These tools are designed to help you improve performance, not judge you. Use them to identify opportunities, track progress, and make data-driven decisions for your security company's success!