Troubleshooting

Common Issues

1. **Data Not Updating**

   - Check Google Sheets sharing permissions
   - Verify data format consistency
   - Review refresh settings

2. **Metric Calculation Errors**

   - Confirm formula syntax
   - Check for null values
   - Verify data types

3. **Visualization Problems**

   - Clear dashboard cache
   - Reset time range
   - Check metric mappings

Performance Optimization

1. **Sheet Optimization**

   - Limit to essential columns
   - Use appropriate data types
   - Remove empty rows/columns

2. **Dashboard Performance**

   - Limit widgets per dashboard
   - Use efficient date ranges
   - Cache frequently used metrics

Best Practices

1. **Data Management**

   - Regular data backups
   - Consistent naming conventions
   - Documentation of formulas

2. **Dashboard Organization**

   - Logical metric grouping
   - Clear widget labels
   - Consistent color scheme

3. **Maintenance**

- Weekly data audits
- Monthly permission reviews
- Quarterly cleanup of unused metrics