full_note_auto_partes_20251001

October 1, 2025

1 Business Intelligence Dashboard

Automated insights for data-driven decisions

[67]:

```
# input_file = 'data/auto_partes/auto_partes_transactions.csv'  # Input CSV file
input_file = 'data/auto_partes/auto_partes_transactions.csv'  # Input CSV file

config = {
    'project_name': 'auto_partes',       # Project name
    'out_dir' : 'outputs',               # Output directory

    # Data mapping
    'date_col': 'fecha',
    'product_col': 'producto',
    'description_col': 'glosa',
    'revenue_col': 'total',
    'quantity_col': 'cantidad',
    'transaction_col': 'trans_id',
    'cost_col': 'costo',

    # Analysis settings
    'analysis_date': '2024-07-01',      # Or 'current' for today
    'top_products_threshold': 0.2,
    'dead_stock_days': 30,
    'currency_format': 'CLP',
    'language': 'EN',
}

save = False  # True to save outputs, False to just print
```

[68]:

```
from modules.business_analytics import BusinessAnalyzer
from modules.dashboard import ExecutiveDashboard
from modules.advanced_analytics import AdvancedAnalytics
from modules.reports import *
from modules.utils import *

# Initialize with AdvancedAnalytics (includes all functionality)
# AdvancedAnalytics -> BusinessAnalyzer -> Business (inheritance chain)
```

```python
analyzer = BusinessAnalyzer(data_source=input_file, config=config)

# Create dashboard and advanced analytics instances
dashboard = ExecutiveDashboard(analyzer)
advanced = AdvancedAnalytics(analyzer)
```

```
Data date range: 2024-05-01 to 2024-06-30
Business initialized with data from:
data/auto_partes/auto_partes_transactions.csv (5527, 13)
Output directory: outputs\auto_partes\20251001_2020
  All base metrics calculated
BusinessAnalyzer initialized for project: auto_partes
Dashboard output directory: outputs\auto_partes\20251001_2020
AdvancedAnalytics initialized for project: auto_partes
```

1.1 Quick Summary

[69]:

```python
summary = dashboard.create_quick_summary()
print_info(summary, analyzer.out_dir, "DASH_quick_summary.txt", save=save)
```

```
============================================================
DASHBOARD SUMMARY
============================================================

  KEY METRICS:
  • Total Revenue: $ 391.651.000
  • Growth Rate: -12.6%
  • Transactions: 5,527

  CRITICAL ACTIONS:
  • 2 products haven't sold in 30+ days
    → Consider liquidation or promotional campaigns
  • Revenue declining by 12.6%
    → Urgent review of sales strategy needed

  KEY INSIGHTS:
  • Top 20% of products = 59.3% of revenue
  • Inventory Health: 58% healthy
  • Dead Stock: 0 products

============================================================
```

1.2 KPIs

[70]:

```python
kpis = analyzer.get_kpis()
print_info(analyzer.print_kpis(), analyzer.out_dir, "BA_kpi.txt", save=save)
```

```

  Periods considered for growth:
```

```
  • Previous: 2024-05-01 -> 2024-05-31
  • Current:  2024-05-31 -> 2024-06-30
 Growth: -12.6%

 Revenue: $ 391.651.000
 Transactions: 5,527
```

1.3 Alerts & Actions

[71]:

```
alerts = analyzer.get_alerts()
print_info(analyzer.print_alerts(), analyzer.out_dir, "BA_alerts.txt",␣
 ↪save=save)
```

```
 CRITICAL ACTIONS REQUIRED:

  2 products haven't sold in 30+ days
  Impact: Cash tied up in non-moving inventory
   Action: Consider liquidation or promotional campaigns

  Revenue declining by 12.6%
  Impact: Negative business trend
   Action: Urgent review of sales strategy needed

 SUCCESS INDICATORS:

  Revenue well distributed across products
   Next Step: Maintain current portfolio balance
```

1.4 Revenue Concentration Analysis

[72]:

```
pareto = analyzer.get_pareto_insights()
print_info(analyzer.print_pareto(), analyzer.out_dir, "BA_pareto.txt",␣
 ↪save=save)
```

```
 TOP INSIGHT: Your top 7 products (20% of catalog) generate 59.3% of revenue!

Concentration Risk Level: Low

 Top 5 Revenue Generators:
  1. NEUMATICO 185/60 R14 INVIERNO: $ 79.475.000
  2. NEUMATICO 195/65 R15 VERANO: $ 33.675.000
  3. NEUMATICO 205/55 R16 VERANO: $ 29.340.000
  4. ACEITE MOTOR 5W30 SINTETICO 4L: $ 25.560.000
  5. NEUMATICO 215/60 R17 TODO TERRENO: $ 24.780.000

 80/20 Rule: Top 20% = 59.3% of revenue
```

1.5 Inventory Health Check

[73]:

```
inventory = analyzer.get_inventory_health()
print_info(analyzer.print_inventory_health(), analyzer.out_dir, "BA_inventory.
 ↪txt", save=save)
```

```
Inventory Health Score: 58%

Dead Stock Alert: 0 products

Products At Risk (Slowing):
• PIEZA MOTOR ALFA ROMEO CLASICO: 57 days since last sale
• KIT SUSPENSION RACING: 32 days since last sale
```

1.6 Operational Efficiency

[74]:

```
peak_times = analyzer.get_peak_times()
print_info(analyzer.print_peak_times(), analyzer.out_dir, "BA_peak_times.txt",␣
 ↪save=save)
```

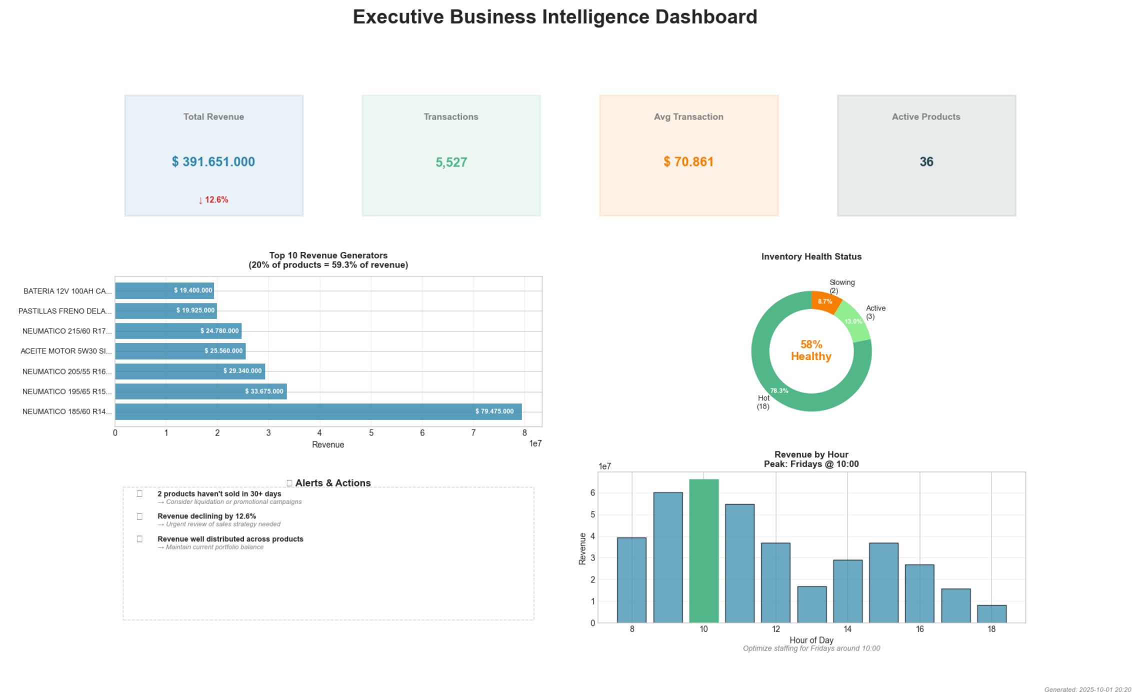
```
Peak Performance Windows:
• Best Day: Fridays
• Peak Hour: 10:00
• Slowest Day: Sundays

Optimize staffing for Fridays around 10:00
```

2 Visuals

2.1 Executive Dashboard

[75]:

```
# Create and display the executive dashboard
fig = dashboard.create_full_dashboard(figsize=(20, 12))
print_fig(fig, dashboard.analyzer.out_dir, "DASH_executive.png", save=save)
```



□ Alerts & Actions

□ **2 products haven't sold in 30+ days**
→ Consider liquidation or promotional campaigns

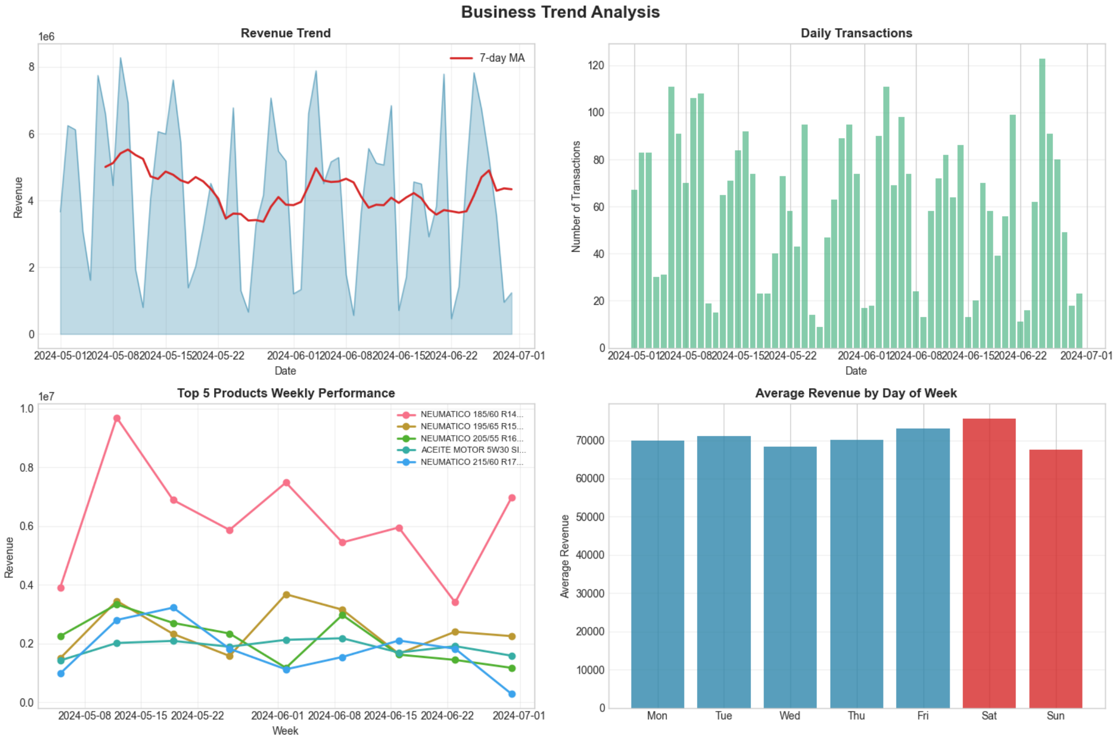
□ **Revenue declining by 12.6%**
→ Urgent review of sales strategy needed

□ **Revenue well distributed across products**
→ Maintain current portfolio balance

2.2 Trend analysis

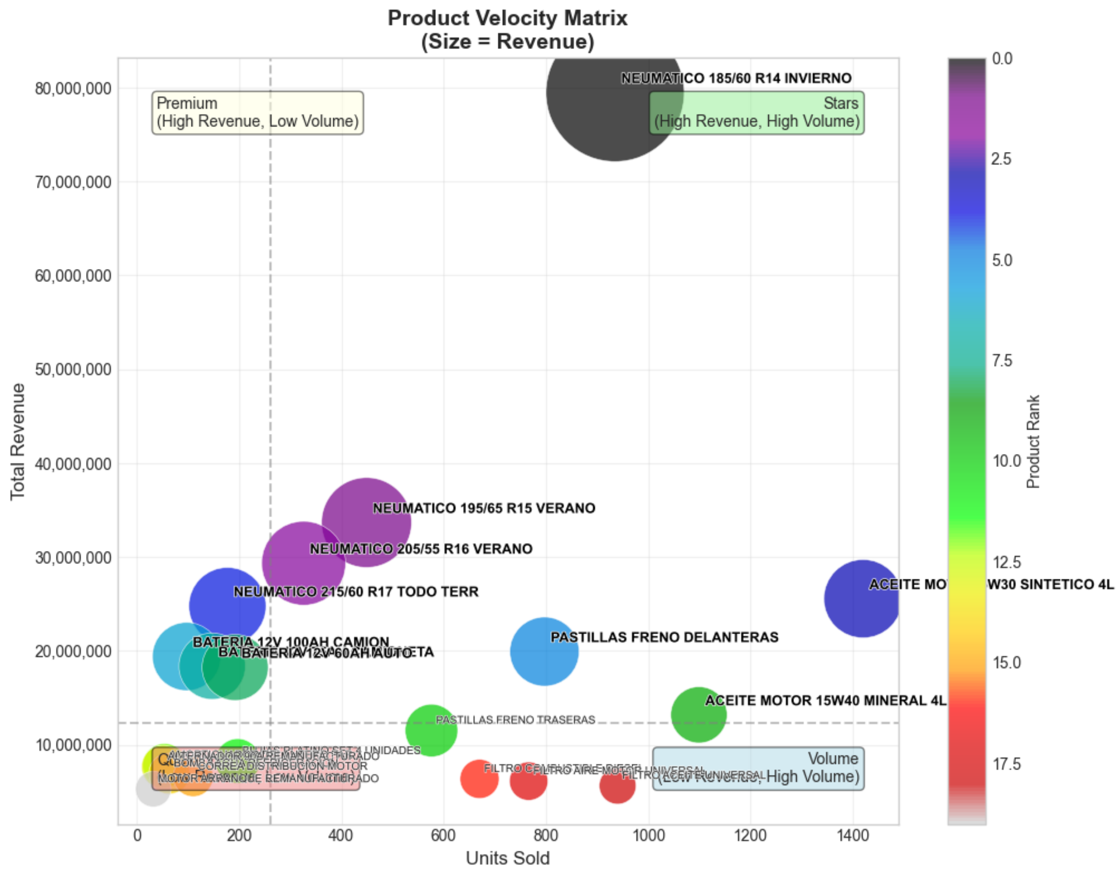
[76]:

```
trend_fig = advanced.create_trend_analysis(figsize=(15, 10))
print_fig(trend_fig, dashboard.analyzer.out_dir, "DASH_trend.png", save=save)
```



2.3 Product velocity

```
[77]: velocity_fig = product_velocity_matrix(analyzer)
print_fig(velocity_fig, dashboard.analyzer.out_dir, "DASH_velocity.png",␣
  ↪save=save)
```



3 Advanced Analytics

3.1 Forecast

[78]:

```
forecast = advanced.calculate_revenue_forecast(days_ahead=30)
print_info(advanced.print_revenue_forecast(), analyzer.out_dir, "ADV_forecast.
↪txt", save=save)
```

```
 Revenue Forecast for next 30 days:
Daily:
- Average: $ 4.336.571
- Std Dev: $ 2.288.257
- 95% Confidence Interval: ($ 0, $ 8.821.555)
Total:
- Forecast: $ 130.097.143
- 95% Confidence Interval: ($ 0, $ 264.646.640)
- Trend: Increasing
```

3.2 Cross-sell opportunities

[79]:

```
cross_sell = advanced.calculate_cross_sell_opportunities(limit=3)
print_info(advanced.print_cross_sell_opportunities(), analyzer.out_dir,␣
 ↪"ADV_cross_selling.txt", save=save)
```

```
No significant cross-sell opportunities found.
```

3.3 Anomalies

[80]:

```
anomalies = advanced.calculate_anomalies(limit=3)
print_info(advanced.print_anomalies(), analyzer.out_dir, "ADV_anomalies.txt",␣
 ↪save=save)
```

```
No anomalies detected.
```

3.4 Top Recommmendations

[81]:

```
recommendations = advanced.calculate_recommendations()
print_info(advanced.print_recommendations(), analyzer.out_dir,␣
 ↪"ADV_recommendations.txt", save=save)
```

```
No actionable recommendations found.
```

4 Reports

4.1 Weekly Comparison Report

[82]:

```
weekly_comparison_report = weekly_comparison_report(analyzer)
print_info(weekly_comparison_report, analyzer.out_dir, "REPORTS_weekly_compare.
 ↪txt", save=save)
```

```
============================================================
WEEKLY COMPARISON REPORT
============================================================

Revenue:
  Last Week:     $ 30.356.000
  Previous Week: $ 25.453.500
  Change:         ↑ 19.26%

Transactions:
  Last Week:     446
  Previous Week: 349
  Change:         ↑ 27.79%

Products Sold:
  Last Week:     31
  Previous Week: 30
  Change:          ↑ 3.33%

Avg Transaction:
  Last Week:     $ 68.063
  Previous Week: $ 72.933
  Change:          ↓ 6.68%
```