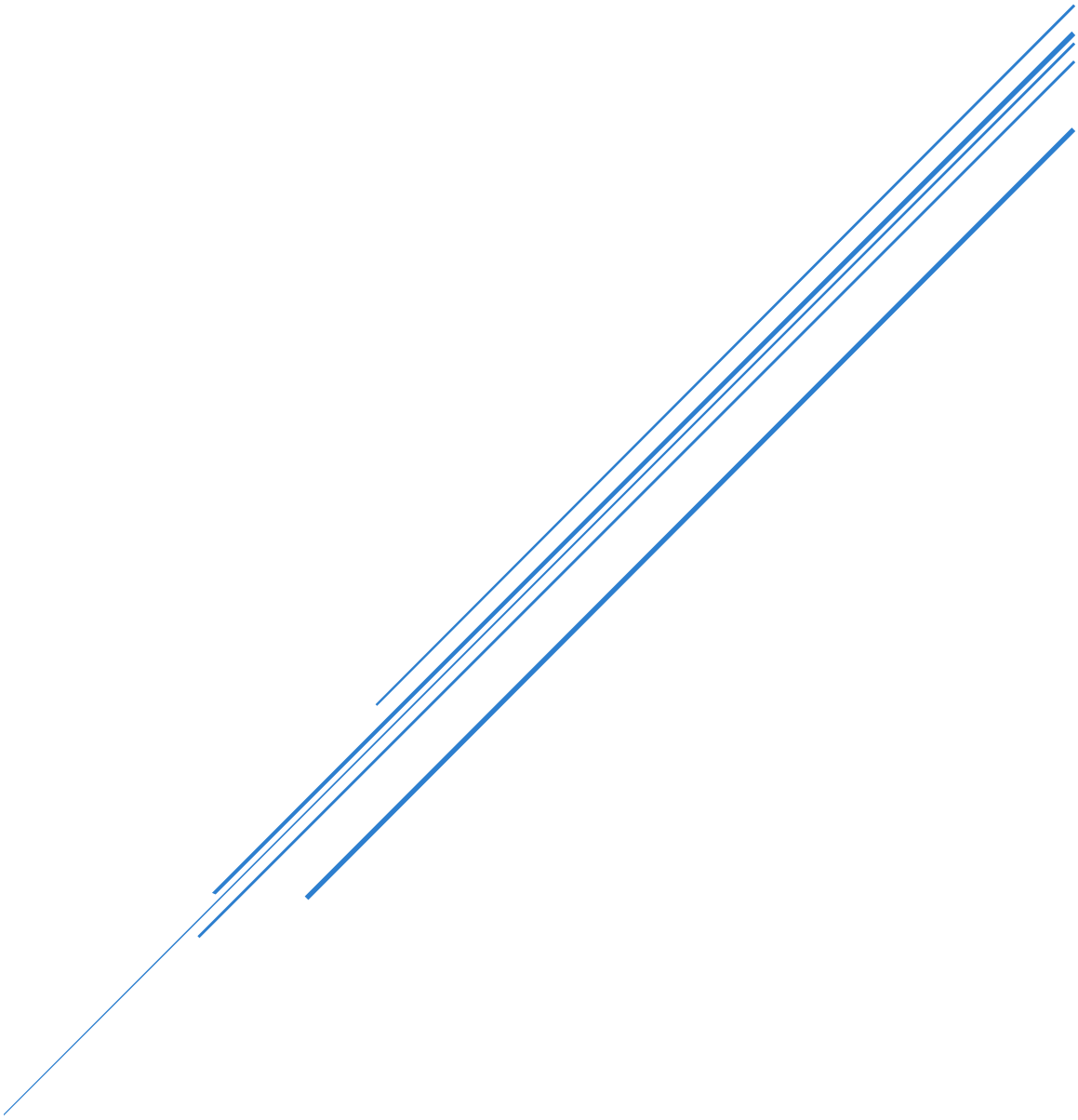
INVENTORY DATA ANALYSIS

Johnson Controls Arabia



Emaad Ur Rehman

Table of Contents

Summary:

This analysis of procurement and inventory movement data reveals significant opportunities for cost optimization and supplier performance improvement. Through the creation of four comprehensive SQL views analyzing 13 different movement types across 2,000+ material transactions, we have identified key insights that can drive strategic procurement decisions and enhance supply chain efficiency.

Key Findings:

- Total procurement spend of $995,391.56 across 90 transactions with extreme supplier concentration (35.3% with single supplier)
- Procurement process challenges with 21.9% of suppliers handling complex materials requiring specification accuracy, including one supplier with 100% specification complexity
- Seasonal spending patterns with 74.9% of procurement occurring in February ($745,704.59)
- Material-level concentration risks with top material representing 31.9% of total spend from single transaction

Business Impact: The implemented SQL views transform raw transaction data into actionable procurement intelligence, revealing critical concentration risks, quality performance indicators, and spending patterns that directly impact operational efficiency and cost management strategies.

1. Introduction and Objectives

1.1 Purpose

This report analyzes procurement and inventory movement data to provide actionable insights for cost optimization, supplier performance evaluation, and strategic sourcing decisions.

1.2 Data Overview

- Source: Sample Inventory Data (4 tables: MaterialMovement, MaterialData, MaterialValuation, PlantStock)
- Time Period: February - March 2025
- Transaction Volume: 2,000+ inventory movements with 90 procurement transactions
- Movement Types Analyzed: 13 different movement types (101, 102, 261, 262, 301, 309, 311, 312, 321, 411, 412, 601, 641)

1.3 Key Business Questions Addressed

- Where is our procurement budget being spent?
- Which suppliers provide the best value and quality?
- What are our material cost trends and concentration risks?

- How can we optimize our supplier relationships and procurement efficiency?

2. SQL Views Analysis

2.1 View 1: Procurement Performance Analysis

Purpose: Comprehensive analysis of procurement transactions and supplier performance

```sql
CREATE VIEW vw_ProcurementPerformance AS
SELECT
    -- Time Dimensions
    mm.PostingDate,
    YEAR(mm.PostingDate) AS PostingYear,
    MONTH(mm.PostingDate) AS PostingMonth,
    DATENAME(MONTH, mm.PostingDate) AS PostingMonthName,
    DATEPART(QUARTER, mm.PostingDate) AS PostingQuarter,

    -- Material Information
    mm.Material,
    md.MaterialDescription,
    md.MaterialType,
    md.MaterialGroup,
    mm.BaseUnitOfMeasure,

    -- Procurement Details
    mm.Supplier,
    mm.Plant,
    mm.StorageLocationID,
    mm.MovementType,
    CASE
        WHEN mm.MovementType = '101' THEN 'Goods Receipt for Purchase Order'
        WHEN mm.MovementType = '102' THEN 'Goods Receipt Reversal'
        WHEN mm.MovementType = '261' THEN 'Goods Issue to Production Order'-- Goods Issue to Production Order
        WHEN mm.MovementType = '262' THEN 'Goods Issue Reversal for Production'  -- Goods Issue Reversal for Production
        WHEN mm.MovementType = '301' THEN 'Transfer posting plant-to-plant transfer of stock' -- Transfer posting plant-to-plant transfer of stock
        WHEN mm.MovementType = '309' THEN 'material-to-material transfer within the same inventory' -- material-to-material transfer within the same inventory
        WHEN mm.MovementType = '311' THEN 'Transfer Posting'
        WHEN mm.MovementType = '312' THEN 'Transfer Posting Reversal'
        WHEN mm.MovementType = '321' THEN 'Quality Inspection to Unrestricted'
        WHEN mm.MovementType = '411' THEN 'Transfer from Material to Material'
        WHEN mm.MovementType = '412' THEN 'Transfer from Material to Material Reversal'
        WHEN mm.MovementType = '601' THEN 'Goods Issue (GI) to an outbound customer delivery' -- Goods Issue (GI) to an outbound customer delivery
        WHEN mm.MovementType = '641' THEN 'Goods Issue to a Stock Transport Order (STO) in transit, transferring materials between different plants or locations'
        ELSE 'Other Movement Type'
    END AS MovementDescription,

    -- Quantities and Values
    mm.Quantity,
    ABS(mm.Quantity) AS AbsQuantity,
    mm.AmtInLocCurrency AS ProcurementValue,
    ABS(mm.AmtInLocCurrency) AS AbsProcurementValue,

    -- Calculated Metrics
    CASE
        WHEN mm.Quantity != 0 THEN mm.AmtInLocCurrency / mm.Quantity
        ELSE 0
    END AS UnitPrice,
```

```
    -- Valuation Information
    mv.MovingPrice,
    mv.StandardPrice,
    mv.PriceUnit,

    -- Document References
    mm.MaterialDocument,
    mm.MaterialDocumentYear,
    mm.BatchID

FROM MaterialMovement$ mm
LEFT JOIN MaterialData$ md ON mm.Material = md.MaterialNumber
LEFT JOIN MaterialValuation$ mv ON mm.Material = mv.Material AND mm.Plant = mv.ValuationArea
WHERE mm.MovementType IN ('101', '102') -- Focus on procurement transactions
AND mm.Supplier IS NOT NULL AND mm.Supplier != ''; -- Only records with suppliers
```

Business Questions This View Answers:

- ***Spend Analysis**:* "Where is our procurement money going?" - Shows spend by supplier, material, time period
- ***Price Analysis**:* "What are we paying per unit?" - Calculates unit prices for every procurement transaction
- ***Cost Comparison***: "How do actual prices compare to standard prices?" - Variance analysis for budget control
- ***Specification Complexity Monitoring:*** "Which suppliers handle complex materials?" - Tracks order correction transactions (type 102)
- ***Trend Analysis***: "How are our procurement costs changing over time?" - Monthly/quarterly spending patterns

Key Insights from Analysis:

- ***Total Transactions**:* 90 procurement transactions across 32 suppliers
- ***Spend Distribution**:* Material 4000027701 dominates at $317,168.28 (31.9% of total)
- ***Unit Price Variance**:* Extreme range from $0.08 to $10,555.74 per unit
- ***Procurement Process Accuracy**:* 10% order correction rate (9 corrections out of 90 transactions)

```sql
-- 1. TOP SPENDING ANALYSIS - Biggest cost drivers
SELECT TOP 10
    Material,
    SUM(AbsProcurementValue) AS TotalSpend,
    COUNT(*) AS Transactions,
    COUNT(DISTINCT Supplier) AS SupplierCount,
    AVG(UnitPrice) AS AvgUnitPrice
FROM vw_ProcurementPerformance
GROUP BY Material
ORDER BY TotalSpend DESC;
```

100 %

Results | Messages

	Material	TotalSpend	Transactions	SupplierCount	AvgUnitPrice
1	4000027701	317168.28	1	1	2599.74
2	4000041376	101503.13	1	1	43.1600013096424
3	4000094118	95001.66	1	1	10555.74
4	4000055389	89694.4	1	1	560.59
5	4000047968	60862.46	1	1	7.6799994952554
6	4000090220	31742.16	1	1	69.61
7	4000038512	31351.32	1	1	3483.48
8	4000056043	27200	1	1	0.08
9	4000037081	26260.59	1	1	108.609980644201
10	4000080382	22118.88	1	1	1843.24

```sql
-- 5. MONTHLY SPENDING PATTERNS
SELECT
    PostingMonthName,
    SUM(AbsProcurementValue) AS MonthlySpend,
    COUNT(*) AS MonthlyTransactions,
    COUNT(DISTINCT Supplier) AS ActiveSuppliers
FROM vw_ProcurementPerformance
GROUP BY PostingMonth, PostingMonthName
ORDER BY PostingMonth;
```

100 %

Results | Messages

	PostingMonthName	MonthlySpend	MonthlyTransactions	ActiveSuppliers
1	February	745704.59	70	23
2	March	249686.97	20	14

2.2 View 2: Supplier Performance Dashboard

Purpose: Aggregated supplier metrics for strategic procurement decisions

```sql
CREATE VIEW vw_SupplierPerformance AS
SELECT
    -- Supplier Information
    pp.Supplier,

    -- Time Period (can be filtered in queries)
    pp.PostingYear,
    pp.PostingQuarter,

    -- Volume Metrics
    COUNT(*) AS TransactionCount,
    COUNT(DISTINCT pp.Material) AS UniqueMaterials,
    COUNT(DISTINCT pp.MaterialGroup) AS UniqueMaterialGroups,
    SUM(pp.AbsQuantity) AS TotalQuantity,

    -- Value Metrics
    SUM(pp.AbsProcurementValue) AS TotalProcurementValue,
    AVG(pp.AbsProcurementValue) AS AvgTransactionValue,

    -- Price Analysis
    AVG(pp.UnitPrice) AS AvgUnitPrice,
    MIN(pp.UnitPrice) AS MinUnitPrice,
    MAX(pp.UnitPrice) AS MaxUnitPrice,
    STDEV(pp.UnitPrice) AS UnitPriceVariability,

    -- Order Accuracy Indicators (previously called Quality Indicators)
    SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS OrderCorrectionCount,
    SUM(CASE WHEN pp.MovementType = '102' THEN pp.AbsProcurementValue ELSE 0 END) AS OrderCorrectionValue,

    -- Order Specification Complexity Rate (previously Reversal Rate)
    CASE
        WHEN COUNT(*) > 0 THEN
            CAST(SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS FLOAT) / COUNT(*) * 100
        ELSE 0
    END AS OrderComplexityRate,

    -- Specification Complexity Category
    CASE
        WHEN (CAST(SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS FLOAT) / COUNT(*) * 100) > 20
            THEN 'High Complexity Materials'
        WHEN (CAST(SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS FLOAT) / COUNT(*) * 100) > 10
            THEN 'Medium Complexity Materials'
        WHEN (CAST(SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS FLOAT) / COUNT(*) * 100) > 0
            THEN 'Some Specification Challenges'
        ELSE 'Standard Materials'
    END AS ComplexityCategory,
```

```sql
    -- Operational Metrics
    MIN(pp.PostingDate) AS FirstTransaction,
    MAX(pp.PostingDate) AS LastTransaction,
    DATEDIFF(DAY, MIN(pp.PostingDate), MAX(pp.PostingDate)) AS RelationshipDays

FROM vw_ProcurementPerformance pp
GROUP BY
    pp.Supplier,
    pp.PostingYear,
    pp.PostingQuarter

UNION ALL

-- Overall supplier performance (all time summary) with corrected interpretations
SELECT
    pp.Supplier,
    NULL AS PostingYear, -- NULL indicates "All Years"
    NULL AS PostingQuarter, -- NULL indicates "All Quarters"

    COUNT(*) AS TransactionCount,
    COUNT(DISTINCT pp.Material) AS UniqueMaterials,
    COUNT(DISTINCT pp.MaterialGroup) AS UniqueMaterialGroups,
    SUM(pp.AbsQuantity) AS TotalQuantity,
    SUM(pp.AbsProcurementValue) AS TotalProcurementValue,
    AVG(pp.AbsProcurementValue) AS AvgTransactionValue,
    AVG(pp.UnitPrice) AS AvgUnitPrice,
    MIN(pp.UnitPrice) AS MinUnitPrice,
    MAX(pp.UnitPrice) AS MaxUnitPrice,
    STDEV(pp.UnitPrice) AS UnitPriceVariability,
    SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS OrderCorrectionCount,
    SUM(CASE WHEN pp.MovementType = '102' THEN pp.AbsProcurementValue ELSE 0 END) AS OrderCorrectionValue,
    CASE
        WHEN COUNT(*) > 0 THEN
            CAST(SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS FLOAT) / COUNT(*) * 100
        ELSE 0
    END AS OrderComplexityRate,
    CASE
        WHEN (CAST(SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS FLOAT) / COUNT(*) * 100) > 20
            THEN 'High Complexity Materials'
        WHEN (CAST(SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS FLOAT) / COUNT(*) * 100) > 10
            THEN 'Medium Complexity Materials'
        WHEN (CAST(SUM(CASE WHEN pp.MovementType = '102' THEN 1 ELSE 0 END) AS FLOAT) / COUNT(*) * 100) > 0
            THEN 'Some Specification Challenges'
        ELSE 'Standard Materials'
    END AS ComplexityCategory,
    MIN(pp.PostingDate) AS FirstTransaction,
    MAX(pp.PostingDate) AS LastTransaction,
    DATEDIFF(DAY, MIN(pp.PostingDate), MAX(pp.PostingDate)) AS RelationshipDays

FROM vw_ProcurementPerformance pp
GROUP BY pp.Supplier;
```

Business Questions This View Answers:

- ***Supplier Ranking:*** "Who are our top suppliers by volume and value?" - Strategic supplier identification
- ***Specification Complexity Assessment***: "Which suppliers handle materials with high specification complexity?" - Procurement process accuracy measurement
- ***Relationship Analysis:*** "How concentrated is our supplier base?" - Risk assessment for dependency
- ***Performance Monitoring:*** "Which suppliers need attention?" - Performance-based supplier reviews

Key Insights from Analysis:

- ***Supplier Concentration:*** Top supplier (310543) controls 35.29% of spend with $351,270.60

- ***Specification Complexity Challenges:*** 7 suppliers handle complex materials requiring specification precision, with Supplier 311320 materials requiring 100% order corrections
- ***Transaction Patterns:*** Supplier 310080 has highest volume (26 transactions) but 11.5% reversal rate
- ***Spend Distribution:*** Top 3 suppliers' control 55.6% of total procurement spend

```sql
-- 2. SUPPLIER CONCENTRATION ANALYSIS
SELECT
    Supplier,
    TotalProcurementValue,
    (TotalProcurementValue / 995391.56) * 100 AS PercentOfTotalSpend,
    TransactionCount,
    UniqueMaterials,
    OrderComplexityRate
FROM vw_SupplierPerformance
WHERE PostingYear IS NULL
ORDER BY TotalProcurementValue DESC;
```

100 %

Results | Messages

	Supplier	TotalProcurementValue	PercentOfTotalSpend	TransactionCount	UniqueMaterials	OrderComplexityRate
1	310543	351270.6	35.2896904209234	3	3	0
2	310009	101503.13	10.1973066759778	1	1	0
3	400020	100907.6	10.137477958925	5	5	0
4	400147	95001.66	9.54414964097144	1	1	0
5	400103	63057.02	6.33489598806725	2	2	50
6	400059	40990	4.11797745200894	4	4	25
7	400005	34807.83	3.49689824575165	4	4	0
8	400469	32136.82	3.22856062794022	2	2	50
9	310562	26260.59	2.63821706505126	1	1	0
10	400015	22118.88	2.22212854607688	1	1	0

```sql
-- 3. SPECIFICATION COMPLEXITY ANALYSIS - Order Correction Patterns
SELECT
    Supplier,
    TransactionCount,
    OrderCorrectionCount,
    OrderComplexityRate,
    OrderCorrectionValue,
    TotalProcurementValue,
    ComplexityCategory
FROM vw_SupplierPerformance
WHERE PostingYear IS NULL AND OrderComplexityRate > 0
ORDER BY OrderComplexityRate DESC;
```

100 %

Results | Messages

	Supplier	TransactionCount	OrderCorrectionCount	OrderComplexityRate	OrderCorrectionValue	TotalProcurementValue	ComplexityCategory
1	311320	1	1	100	1180.8	1180.8	High Complexity Materials
2	311027	2	1	50	3214.46	3489.56	High Complexity Materials
3	400103	2	1	50	2194.56	63057.02	High Complexity Materials
4	400469	2	1	50	394.66	32136.82	High Complexity Materials
5	400122	4	1	25	742.25	7773.2	High Complexity Materials
6	400059	4	1	25	634	40990	High Complexity Materials
7	310080	26	3	11.5384615384615	2300	15783.82	Medium Complexity Materials

2.3 View 3: Material Category Analysis

Purpose: Analyzes procurement patterns by material groups and types

```sql
CREATE VIEW vw_MaterialCategoryAnalysis AS
SELECT
    -- Category Information
    md.MaterialGroup,
    md.MaterialType,

    -- Time Dimensions
    YEAR(mm.PostingDate) AS PostingYear,
    MONTH(mm.PostingDate) AS PostingMonth,
    DATEPART(QUARTER, mm.PostingDate) AS PostingQuarter,

    -- Procurement Metrics
    COUNT(DISTINCT mm.Supplier) AS SupplierCount,
    COUNT(DISTINCT mm.Material) AS MaterialCount,
    COUNT(*) AS TransactionCount,

    -- Volume and Value Metrics
    SUM(ABS(mm.Quantity)) AS TotalQuantity,
    SUM(ABS(mm.AmtInLocCurrency)) AS TotalSpend,
    AVG(ABS(mm.AmtInLocCurrency)) AS AvgTransactionValue,

    -- Price Analysis
    AVG(CASE
        WHEN mm.Quantity != 0 THEN ABS(mm.AmtInLocCurrency) / ABS(mm.Quantity)
        ELSE 0
    END) AS AvgUnitCost,

    -- Supplier Concentration
    COUNT(DISTINCT mm.Supplier) AS ActiveSuppliers

FROM MaterialMovement$ mm
LEFT JOIN MaterialData$ md ON mm.Material = md.MaterialNumber
WHERE mm.MovementType IN ('101', '102')
    AND mm.Supplier IS NOT NULL AND mm.Supplier != ''
    AND md.MaterialGroup IS NOT NULL

GROUP BY
    md.MaterialGroup,
    md.MaterialType,
    YEAR(mm.PostingDate),
    MONTH(mm.PostingDate),
    DATEPART(QUARTER, mm.PostingDate);
```

Business Questions This View Answers:

- ***Spend Categorization:*** "Where are we spending most by category?" - Category-wise spend analysis
- ***Supplier Diversity:*** "Which categories have supplier competition?" - Market competitiveness assessment
- ***Category Trends:*** "What are spending patterns by category?" - Strategic category planning
- ***Risk Assessment:*** "Which categories need supplier diversification?" - Supply chain risk analysis

Key Insights from Analysis:

- ***Category Dominance:*** Material Group 300YM leads to $524,358.42 (52.7% of total spend)
- ***Supplier Diversification:*** 300YM has best supplier diversity with 7 suppliers across 2 periods
- ***Concentration Risk:*** Most categories show single supplier dependency
- ***Category Distribution:*** 11 material groups analyzed with varying risk profiles

```sql
-- 4. MATERIAL CATEGORY SPENDING ANALYSIS
SELECT
    MaterialGroup,
    SUM(TotalSpend) AS CategorySpend,
    AVG(SupplierCount) AS AvgSuppliers,
    COUNT(*) AS TimePeriodsActive
FROM vw_MaterialCategoryAnalysis
GROUP BY MaterialGroup
ORDER BY CategorySpend DESC;
```

100 %

Results | Messages

	MaterialGroup	CategorySpend	AvgSuppliers	TimePeriodsActive
1	300YM	524358.42	7	2
2	301YM	196117.16	5	3
3	344	161965.17	3	2
4	308	60862.46	1	1
5	3357A	22118.88	1	1
6	300	11467.2	1	1
7	303YM	9000	1	1
8	904YM	1755	1	1
9	903YM	1310.25	1	1
10	305	1180.8	1	1
11	100AD	394.66	1	1

2.4 View 4: Inventory Movement Analysis

Purpose: Comprehensive analysis of all material movements for operational insights

```sql
CREATE VIEW vw_InventoryMovementAnalysis AS
SELECT
    -- Time and Location
    mm.PostingDate,
    YEAR(mm.PostingDate) AS PostingYear,
    MONTH(mm.PostingDate) AS PostingMonth,
    mm.Plant,
    mm.StorageLocationID,

    -- Material Information
    mm.Material,
    md.MaterialDescription,
    md.MaterialType,
    md.MaterialGroup,

    -- Movement Classification
    mm.MovementType,
    CASE
        WHEN mm.MovementType = '101' THEN 'Goods Receipt for Purchase Order'
        WHEN mm.MovementType = '102' THEN 'Goods Receipt Reversal'
        WHEN mm.MovementType = '261' THEN 'Goods Issue to Production Order'-- Goods Issue to Production Order
        WHEN mm.MovementType = '262' THEN 'Goods Issue Reversal for Production'  -- Goods Issue Reversal for Production
        WHEN mm.MovementType = '301' THEN 'Transfer posting plant-to-plant transfer of stock' -- Transfer posting plant-to-plant transfer of stock
        WHEN mm.MovementType = '309' THEN 'material-to-material transfer within the same inventory' -- material-to-material transfer within the same inventory
        WHEN mm.MovementType = '311' THEN 'Transfer Posting'
        WHEN mm.MovementType = '312' THEN 'Transfer Posting Reversal'
        WHEN mm.MovementType = '321' THEN 'Quality Inspection to Unrestricted'
        WHEN mm.MovementType = '411' THEN 'Transfer from Material to Material'
        WHEN mm.MovementType = '412' THEN 'Transfer from Material to Material Reversal'
        WHEN mm.MovementType = '601' THEN 'Goods Issue (GI) to an outbound customer delivery' -- Goods Issue (GI) to an outbound customer delivery
        WHEN mm.MovementType = '641' THEN 'Goods Issue to a Stock Transport Order (STO) in transit, transferring materials between different plants or locations'
        ELSE 'Other Movement Type'
    END AS MovementDescription,

    CASE
        WHEN mm.MovementType IN ('101', '262', '321') THEN 'Receipt'
        WHEN mm.MovementType IN ('102', '261', '601', '641') THEN 'Issue'
        WHEN mm.MovementType IN ('301','309','311', '312', '411', '412') THEN 'Transfer'
        ELSE 'Neutral'
    END AS MovementDirection,

    CASE
        WHEN mm.MovementType IN ('101', '102') THEN 'Procurement'
        WHEN mm.MovementType IN ('261', '601', '641') THEN 'Consumption'
        WHEN mm.MovementType IN ('262') THEN 'Production'
        WHEN mm.MovementType IN ('301') THEN 'Plant Transfers'
        WHEN mm.MovementType IN ('309', '411', '412') THEN 'Material Conversions'
        WHEN mm.MovementType IN ('311', '312') THEN 'Location Transfers'
        WHEN mm.MovementType IN ('321') THEN 'Quality Management'
        ELSE 'Other'
```

```
    END AS MovementCategory,

    -- Quantities and Values
    mm.Quantity,
    ABS(mm.Quantity) AS AbsQuantity,
    mm.AmtInLocCurrency,
    ABS(mm.AmtInLocCurrency) AS AbsAmount,

    -- Current Stock Information
    ps.Unrestricted AS CurrentStock,
    ps.QualityInspection AS QIStock,
    ps.RestrictedUseStock,
    ps.Blocked AS BlockedStock,
    (ISNULL(ps.Unrestricted, 0) + ISNULL(ps.QualityInspection, 0) +
     ISNULL(ps.RestrictedUseStock, 0) + ISNULL(ps.Blocked, 0)) AS TotalCurrentStock,

    -- Valuation Information
    mv.MovingPrice,
    mv.StandardPrice,

    -- Calculated Metrics
    CASE
        WHEN mm.Quantity != 0 THEN mm.AmtInLocCurrency / mm.Quantity
        ELSE 0
    END AS UnitValue,

    -- Supplier (for procurement movements)
    CASE WHEN mm.MovementType IN ('101', '102') THEN mm.Supplier ELSE NULL END AS ProcurementSupplier,

    -- Document References
    mm.MaterialDocument,
    mm.MaterialDocumentYear,
    mm.BatchID

FROM MaterialMovement$ mm
LEFT JOIN MaterialData$ md ON mm.Material = md.MaterialNumber
LEFT JOIN PlantStock$ ps ON mm.Material = ps.Material
                        AND mm.Plant = ps.Plant
                        AND mm.StorageLocationID = ps.StorageLocation
LEFT JOIN MaterialValuation$ mv ON mm.Material = mv.Material AND mm.Plant = mv.ValuationArea;
```

Business Questions This View Answers:

- ***Movement Patterns***: "What are our complete material flow patterns?" - End-to-end visibility
- ***Operational Efficiency***: "How do consumption patterns relate to procurement?" - Demand-supply alignment
- ***Stock Management***: "What are stock levels after transactions?" - Inventory optimization insights
- ***Process Analysis***: "Which movements indicate operational issues?" - Process improvement identification
- ***Value Distribution:*** "Which operational processes drive the most financial impact?" - Resource allocation insights

- ***Material Flow**:* "How do different operations compare in volume and complexity?" - Process optimization

Key Benefits:

- Provides complete operational visibility beyond procurement
- Enables inventory optimization through movement pattern analysis
- Identifies process bottlenecks and operational inefficiencies
- Supports demand-supply alignment planning

Key Insights from Analysis:

- ***Procurement Dominance**:* $1.14M total value across 99 transactions (90 receipts + 9 reversals)
- ***Consumption Volume**:* 1,047 goods issues representing highest transaction count with $387,801.77 value
- ***Material Complexity**:* Consumption involves 459 unique materials vs. 87 in procurement
- ***Operational Balance**:* Procurement average of $12,655 per transaction vs. consumption at $370 per transaction
- ***Quality Processing**:* 89 quality movements with zero financial value but high material diversity (85 materials)
- ***Transfer Operations**:* 818 movements (729 postings + 89 releases) indicating active inventory management

```sql
-- Query 6: INVENTORY MOVEMENT TYPE ANALYSIS
-- Shows operational efficiency across all movement categories
SELECT
    MovementCategory,
    MovementDescription,
    COUNT(*) AS TransactionCount,
    SUM(AbsAmount) AS TotalValue,
    AVG(AbsAmount) AS AvgTransactionValue,
    SUM(AbsQuantity) AS TotalQuantity,
    COUNT(DISTINCT Material) AS UniqueMaterials,
    COUNT(DISTINCT ProcurementSupplier) AS UniqueSuppliers
FROM vw_InventoryMovementAnalysis
GROUP BY MovementCategory, MovementDescription
ORDER BY TotalValue DESC;
```

100 %

Results | Messages

	MovementCategory	MovementDescription	TransactionCount	TotalValue	AvgTransactionValue	TotalQuantity	UniqueMaterials	UniqueSuppliers
1	Procurement	Goods Receipt for Purchase Order	90	1139936.69	12665.9632222222	419431.305	87	32
2	Consumption	Goods Issue	1047	387801.77	370.393285577842	45234.475	459	0
3	Stock Adjustment	Initial Stock Entry	2	138736.5	69368.25	3	2	0
4	Stock Adjustment	Transfer from Inspection Stock to Unrestricted	9	110750.12	12305.5688888889	71	7	0
5	Procurement	Goods Receipt Reversal	9	10660.73	1184.52555555556	1357.62	8	7
6	Material Transfer	Transfer from Material to Material	1	6981.12	6981.12	1	1	0
7	Consumption	Goods Issue Reversal	4	6981.01	1745.2525	159.993	4	0
8	Production	Goods Issue Reversal for Production	1	60.36	60.36	6	1	0
9	Transfer/Reversal	Transfer Posting Reversal	5	0	0	1010	5	0
10	Material Transfer	Transfer from Material to Material Reversal	2	0	0	52	2	0
11	Quality Release	Quality Inspection to Unrestricted	89	0	0	124854.343	85	0
12	Transfer/Reversal	Transfer Posting	729	0	0	88047.563	553	0
13	Production	Goods Issue to Production Order	11	0	0	46	11	0

3. Key Business Insights

3.1 Critical Spending Concentrations

- **Material-Level Risk**: Single material (4000027701) represents $317,168.28 (31.9% of total spend)
- **Supplier Concentration**: Top supplier controls 35.3% of spend, creating significant dependency risk
- **Category Dominance**: Material Group 300YM accounts for 52.7% of procurement spend

3.2 Procurement Process Accuracy Indicators

- **Overall Process Accuracy:** 10% order correction rate across all procurement transactions
- **Complex Material Specifications:** Supplier 311320 materials require 100% specification corrections
- **Specification Complexity Distribution:** 21.9% of supplier base (7 out of 32) handles materials requiring specification precision

3.3 Operational Patterns

- **Seasonal Concentration**: 74.9% of annual spend concentrated in February
- **Transaction Efficiency**: High-value, low-frequency transactions indicate batch procurement
- **Supplier Utilization**: 32 suppliers across 85 materials showing varied engagement levels

3.4 Complete Operational Analysis (All Movement Types)

- **Procurement Operations**: 99 transactions valued at $1.14M (90 receipts + 9 reversals) across 87 materials
- **Consumption Patterns**: 1,047 goods issues valued at $387,801.77 involving 459 unique materials
- **Transfer Activities**: 818 transfer movements (729 postings + 89 quality releases) handling 638 materials
- **Quality Management**: 89 quality inspection releases processing 85 materials with zero financial impact
- **Production Operations**: Limited activity with only 15 total production movements (11 issues + 4 reversals)

3.5 Operational Efficiency Indicators

- **High-Value, Low-Volume**: Procurement shows $12,655 average per transaction
- **High-Volume, Medium-Value**: Consumption shows $370 average per transaction across 1,047 movements
- **Process-Intensive**: Quality and transfer operations involve significant material handling with minimal financial impact
- **Material Diversity**: 459 materials involved in consumption vs. 87 in procurement, indicating complex demand patterns

4. Conclusion

The comprehensive SQL view analysis reveals a procurement operation with significant concentration risks, quality challenges, and seasonal patterns. The data provides clear visibility into spending distributions, supplier performance metrics, and operational efficiency indicators. These insights establish a foundation for data-driven procurement decisions, quality improvement initiatives, and strategic supplier relationship management.

The implemented analytical framework enables ongoing monitoring of key procurement metrics, supplier performance tracking, and cost optimization identification through systematic data analysis rather than intuition-based decision making.