**KMS CASE SCENARIO 1 QUESTIONS ANSWERED**

Q1. Which product category has the highest sales ?

ANSWER TO Q1. Technology category has the highest sales

SQL Query that helped me with the answer

SELECT TOP 1

product\_category,

SUM(sales) AS total\_sales

FROM

[DSA\_DB].[dbo].[KMS Sql Case Study Project DATA ANALYSIS]

GROUP BY

product\_category

ORDER BY

total\_sales DESC;

**Answer to Q2. Top 3 and Bottom 3 regions by sales (from highest to lowest)**

RankType region total\_sales

Top 3 West 3,597,549.28

Top 3 Ontario 3,063,212.48

Top 3 Prarie 2,837,304.60

Bottom 3 Yukon 975,867.37

Bottom 3 Northwest Territories 800,847.33

Bottom 3 Nunavut 116,376.48

**Answer to Q3: Total sales of appliances in Ontario**202,346.84

ANSWER TO Q.4 Advise the management of KMS on what to do to increase the revenue from the bottom10 customers

**🔍 1. Overall Comparison — Snapshot**

| **Metric** | **Top 10 Avg** | **Bottom 10 Avg** | **Insight** |
| --- | --- | --- | --- |
| **Total Sales** | ~86,457 | ~259 | ~333x difference — bottom customers contribute negligible revenue. |
| **Total Orders** | ~22 | ~2 | Top customers are highly engaged and repeat buyers. |
| **Avg Quantity** | ~28 | ~20 | Top customers tend to buy more per order. |
| **Avg Discount** | ~4.9% | ~4.3% | Discounts don’t differ much, so price sensitivity might not be the key issue. |
| **Total Profit** | Mostly strong | Several negative | Several bottom customers generate *losses* — potentially unprofitable. |

## 💡 ****2. Key Insights & Business Recommendations****

### ✅ ****IInsight 1: Low Order Volume Is the Biggest Problem****

* Bottom 10 customers are placing **1 to 4 orders total**.
* Top 10 customers have **10 to 41 orders**.

🔧 **Recommendation:**

* **Incentivize repeat purchases** for bottom customers via:
  + Loyalty programs (e.g., “Buy 3x, get reward”)
  + Time-based discounts (e.g., “10% off your next order this month”)
  + Subscription bundles or reorder reminders

### ✅ ****IInsight 2: Several Bottom Customers Are Unprofitable****

* Customers like **Eric Murdock**, **Mark Hamilton**, and **Nicole Fjeld** have **negative profit**, despite sales.
* This may be due to high shipping costs, returns, or excessive discounts.

🔧 **Recommendation:**

* **Review order economics** — e.g., shipping mode vs order size
* For low-volume customers in remote provinces, offer:
  + Digital products/services (if any)
  + Pickup/delivery partnerships
  + Minimum order thresholds for free/discounted shipping

### ✅ ****IInsight 3: Average Discount Is Not the Differentiator****

* Top 10 avg discount: ~4.9%
* Bottom 10 avg discount: ~4.3%
* So price alone is likely **not** the barrier.

🔧 **Recommendation:**

* Focus more on **value perception**, not discounts:
  + Recommend personalized bundles based on their past purchases
  + Promote high-margin but low-cost add-ons
  + Use customer names in email campaigns to re-engage (they’re known but inactive)

### ✅ ****IInsight 4: Product Relevance Could Be an Issue****

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🔧 **Recommendation:**

* Run an additional analysis: to see what product types the bottom 10 customers are buying — to see if they’re only buying less popular or low-repeat items.

If bottom customers are only buying **single-use, low-margin products**, management could consider cross-selling to **higher-margin categories**.

I ran the analysis for the bottom 10 customers by product category, and here was the the output Customer\_Name Product\_Category order\_count

Chris McAfee Furniture 1

Christine Kargatis Furniture 1

Rick Huthwaite Furniture 1

Chris McAfee Office Supplies 1

Christine Kargatis Office Supplies 1

Dorothy Dickinson Office Supplies 1

Eric Murdock Office Supplies 3

Jeremy Farry Office Supplies 2

Katrina Edelman Office Supplies 2

Mark Hamilton Office Supplies 1

Natalie DeCherney Office Supplies 1

Nicole Fjeld Office Supplies 2

Rick Huthwaite Office Supplies 2

Eric Murdock Technology 1

Mark Hamilton Technology 1

### ****What We See in the Data:****

From your analysis of the **bottom 10 customers**:

* **Office Supplies** dominates (11 out of 14 entries).
* **Furniture** appears a few times.
* **Technology** appears least — only 2 records.

### ****Category Characteristics at a Glance:****

| **Category** | **Typical Use** | **Margin Profile** | **Customer Value Potential** |
| --- | --- | --- | --- |
| **Office Supplies** | Frequently needed, low-cost items | 🔻 Low-margin | ✅ Good for engagement, but limited revenue potential |
| **Furniture** | One-time/occasional purchases | 🟡 Medium to high | 💡 High-ticket, but infrequent |
| **Technology** | Higher value, less frequent | 🔺 High-margin | 💰 Strong revenue potential |

### What This Suggests:

1. **Office Supplies** dominance in low-revenue customers implies they’re buying basic, operational items — **low margin and transactional**.
2. Few of them purchased **Furniture** or **Technology**, which are **higher-margin** and **less commoditized**.
3. Customers like **Chris McAfee**, **Rick Huthwaite**, and **Christine Kargatis** are only engaging in 1–2 low-value categories.

### ✅ Recommendation:

I can **confidently say**:

“The bottom 10 customers mostly transact in **Office Supplies**, which are lower-margin, commodity items. This purchasing pattern lacks depth and profitability. To improve revenue and margin from these customers, KMS should:

* Implement **cross-selling** campaigns — e.g., suggest tech products or ergonomic furniture with regular office orders.
* Personalize offers to match business needs (e.g., startups might need bundled office + tech setup).
* Introduce **loyalty or tiered incentives** that reward diversification in product categories.”

**Final Recommendation Summary for KMS Management:**

| **Area** | **Recommendation** |
| --- | --- |
| **Customer Retention** | Loyalty & reorder campaigns targeting low-frequency buyers |
| **Profitability Review** | Audit loss-making customers/products — flag for pricing/logistics corrections |
| **Engagement** | Personalized email campaigns, call outreach, or bundling offers |
| **Product Strategy** | Promote better product mixes to bottom 10 — upsell from data insights |
| **Customer Support** | Offer onboarding or guided purchase support to new or inactive buyers |

Q5 Shipping mode with the highest shipping cost   
Ship\_Mode total\_shipping\_cost

Delivery Truck 51971.9400000000

**KMS CASE SCENARIO 2 QUESTIONS ANSWERED**

Q1) Who are the most valuable customers, and what products or services do they typically  
purchase?

ANSWER: TOP 10 MOST VALUABLE CUSTOMERS BY PURCHASE PATTERNS

**Customer\_Name total\_sales total\_orders product\_category\_count categories\_purchased**

**Emily Phan 117124.4380000000 10 3 Furniture, Office Supplies, Technology**

**Deborah Brumfield 97433.1355000000 20 3 Furniture, Office Supplies, Technology**

**Roy Skaria 92542.1530000000 26 3 Furniture, Office Supplies, Technology**

**Sylvia Foulston 88875.7575000000 24 3 Furniture, Office Supplies, Technology**

**Grant Carroll 88417.0025000000 27 3 Furniture, Office Supplies, Technology**

**Alejandro Grove 83561.9300000000 14 2 Furniture, Office Supplies**

**Darren Budd 81577.3435000000 41 2 Furniture, Technology**

**Julia Barnett 80044.4520000000 21 3 Furniture, Office Supplies, Technology**

**John Lucas 79696.1875000000 18 3 Furniture, Office Supplies, Technology**

**Liz MacKendrick 76306.4315000000 20 3 Furniture, Office Supplies, Technology**

**Top 10 most valuable customers by total sales, grouped by product sub category, product category, total orders and number of product category ordered from**

Customer\_Name total\_sales total\_orders product\_category\_count categories\_purchased subcategories\_purchased

Emily Phan 117124.4380000000 10 3 Furniture, Office Supplies, Technology Appliances, Binders and Binder Accessories, Bookcases, Office Machines, Pens & Art Supplies, Storage & Organization, Telephones and Communication

Deborah Brumfield 97433.1355000000 20 3 Furniture, Office Supplies, Technology Appliances, Binders and Binder Accessories, Chairs & Chairmats, Computer Peripherals, Copiers and Fax, Labels, Office Furnishings, Office Machines, Pens & Art Supplies, Scissors, Rulers and Trimmers, Storage & Organization, Telephones and Communication

Roy Skaria 92542.1530000000 26 3 Furniture, Office Supplies, Technology Appliances, Binders and Binder Accessories, Bookcases, Computer Peripherals, Copiers and Fax, Office Furnishings, Paper, Pens & Art Supplies, Storage & Organization, Tables, Telephones and Communication

Sylvia Foulston 88875.7575000000 24 3 Furniture, Office Supplies, Technology Appliances, Binders and Binder Accessories, Bookcases, Chairs & Chairmats, Computer Peripherals, Envelopes, Labels, Office Furnishings, Office Machines, Rubber Bands, Tables, Telephones and Communication

Grant Carroll 88417.0025000000 27 3 Furniture, Office Supplies, Technology Appliances, Binders and Binder Accessories, Bookcases, Chairs & Chairmats, Computer Peripherals, Labels, Office Furnishings, Paper, Pens & Art Supplies, Storage & Organization, Telephones and Communication

Alejandro Grove 83561.9300000000 14 2 Furniture, Office Supplies Appliances, Binders and Binder Accessories, Chairs & Chairmats, Envelopes, Labels, Office Furnishings, Paper, Pens & Art Supplies, Storage & Organization, Tables

Darren Budd 81577.3435000000 41 2 Furniture, Technology Bookcases, Chairs & Chairmats, Computer Peripherals, Copiers and Fax, Office Furnishings, Office Machines, Tables, Telephones and Communication

Julia Barnett 80044.4520000000 21 3 Furniture, Office Supplies, Technology Appliances, Binders and Binder Accessories, Bookcases, Chairs & Chairmats, Computer Peripherals, Envelopes, Labels, Office Furnishings, Paper, Pens & Art Supplies, Storage & Organization, Tables, Telephones and Communication

John Lucas 79696.1875000000 18 3 Furniture, Office Supplies, Technology Appliances, Chairs & Chairmats, Computer Peripherals, Office Furnishings, Paper, Pens & Art Supplies, Storage & Organization, Tables, Telephones and Communication

Liz MacKendrick 76306.4315000000 20 3 Furniture, Office Supplies, Technology Appliances, Binders and Binder Accessories, Bookcases, Chairs & Chairmats, Computer Peripherals, Envelopes, Labels, Office Furnishings, Office Machines, Paper, Storage & Organization, Telephones and Communication   
  
Q2) Which small business customer had the highest sales?  
ANSWER : Customer\_Name total\_sales

Dennis Kane 75,967.59

Q3) Which corporate customer had the most number of orders between 2009 and 2012?

Customer\_Name total\_orders total\_items\_ordered

Adam Hart 27 506

Q4) Which consumer customer was the most profitable one?

Customer\_Name total\_profit

Emily Phan 34005.4400000000

Q5. Which customer returned items, and what segment do they belong to?  
  
Can’t reliably answer “which customers returned items and what segment do they belong to” from the dataset alone. as there simply aren’t any “negative” sales or quantities in this table—so returns aren’t recorded as reversed invoice lines here. And since there’s no obvious Return\_Flag or Returned column, it means **this dataset doesn’t capture returns** directly.

Q6: . If the delivery truck is the most economical but the slowest shipping method and Express Air is the fastest but the most expensive one, do you think the company  
appropriately spent shipping costs based on the Order Priority? Explain your answer  
  
ANSWERED:

**Firstly,**

**Reasons for my decision in taking out the 'not specified' order priority records as against backfilling them with low, medium, high or critical labels:**

 **Maintain Data Integrity:** Excluding “Not Specified” rows avoids introducing arbitrary or unverified assumptions about order urgency, which could skew your analysis or lead to misguided decisions.

 **Prevent Misclassification Risk:** Backfilling based on rules (time of day, customer history) carries the danger of mislabeling true priorities—better to work with only confidently tagged data.

 **Ensure Consistency Across Reports:** By filtering out unknowns, every KPI report measures the same clean cohort, making trends and comparisons reliable.

 **Highlight the Flagging Gap:** Keeping “Not Specified” visible as a separate category (but excluded from KPIs) underscores to management that the priority‑flagging process needs improvement before those orders can be meaningfully analyzed.

 **Facilitate Targeted Remediation:** Once the root cause is fixed (e.g. missing flag on data entry), you can reassess those orders accurately—until then, better to omit than to guess.

ANALYSING SHIPPING COSTS SPEND BASED ON ORDER PRIORITY--

Order\_Priority Ship\_Mode order\_count total\_shipping\_cost avg\_shipping\_cost

Critical Delivery Truck 228 10783.8200000000 47.3000000000

Critical Express Air 200 1742.1000000000 8.7100000000

Critical Regular Air 1180 8586.7600000000 7.2800000000

High Delivery Truck 248 11206.8800000000 45.1900000000

High Regular Air 1308 10005.0100000000 7.6500000000

High Express Air 212 1453.5300000000 6.8600000000

Low Delivery Truck 250 11131.6100000000 44.5300000000

Low Express Air 190 1551.6300000000 8.1700000000

Low Regular Air 1280 10263.6200000000 8.0200000000

Medium Delivery Truck 205 9461.6200000000 46.1500000000

Medium Express Air 201 1633.5900000000 8.1300000000

Medium Regular Air 1225 9418.7200000000 7.6900000000

**Overall Shipping‑Cost vs. Priority Snapshot:**

| **Priority** | **% Truck** | **Avg Truck Cost** | **% Express Air** | **Avg Express Cost** | **% Regular Air** | **Avg Regular Cost** |
| --- | --- | --- | --- | --- | --- | --- |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Critical** | 14% | ₦47.30 | 12% | ₦8.71 | 74% | ₦7.28 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **High** | 16% | ₦45.19 | 14% | ₦6.86 | 70% | ₦7.65 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Medium** | 12% | ₦46.15 | 12% | ₦8.13 | 76% | ₦7.69 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Low** | 12% | ₦44.53 | 9% | ₦8.17 | 79% | ₦8.02 |

### 1. Shipping‑Mode Cost Ranking Is Upside‑Down

* **Delivery Truck** averages **₦44–47** per order—by far the most expensive.
* **Regular Air** is the cheapest (~₦7–8), with **Express Air** only marginally more expensive.
* This is the exact opposite of your business assumption (“Truck = cheapest; Express = costliest”).

**Action:** Audit how Shipping\_Cost is calculated. It looks like “Truck” may be picking up whole‑route costs (not per package), or Air lines are being subsidized. You need true per‑order averages before you can enforce any “economical vs. urgent” policy.

To briefly explain in simpler terms what I mean when I say like “Truck” may be picking up whole‑route costs (not per package),think of it this way:

* **Per‑Package Cost**: If you ship ten small boxes on one truck trip, you’d expect the cost shown for each box to be just its share of the fuel and driver time (say, ₦5 per box).
* **Whole‑Route Cost**: Instead, our “Truck” mode seems to be charging the **entire trip’s cost** to each box—so if the truck trip costs ₦50 total, each box looks like it cost ₦50 to ship, not ₦5.

In other words, the database is treating the truck’s **total trip expense** as if it applied to every order individually, rather than spreading that cost across all packages on the truck. That makes “Truck” look much more expensive per order than it really is.

### 2. Mode Usage Doesn’t Reflect Priority

* **Critical** orders: 74% go by Regular Air, only 12% use Express.
* **Low** orders: 79% go Regular Air, only 9% Express.
* **High/Medium** follow the same pattern.

**Insight:** There’s virtually **no differentiation** in shipping‐mode mix across priorities. Urgent orders aren’t being funneled into faster (intended) methods.

### 3. Recommendations for KMS Management

1. **Fix Cost Data First**
   * Reconcile Shipping\_Cost to true per‑order cost.
   * If Truck really is cheaper, fine—just rename your modes; if Air is cheaper, update your policy expectations.
2. **Enforce Priority→Mode Mapping**
   * Critical → Express Air (target ≥ 50% of Critical)(in other words, For your most urgent (“Critical”) orders, make sure **at least half** of them go out via **Express Air** so they actually get the fastest delivery.)
   * High → Regular Air (target ≥ 60% of High)(in other words, For “High” priority orders, aim to ship **at least 60%** of them using **Regular Air**, which is fast enough and more cost-effective than Express Air.)
   * Medium/Low → Delivery Truck (target ≥ 70% of Medium / Low)(in other words, For “Medium” and “Low” priority orders, try to ship **at least 70%** of them using the **Delivery Truck** since speed isn't urgent and it's the **cheapest option**.)  
       
     This kind of approach helps match **urgency with shipping speed and cost**, which leads to **smarter spending** without hurting delivery expectations.
3. **Build a Monitoring Report**
   * After policy rollout, track % of priority orders by mode monthly.
   * Flag any deviations > ± 10 pts from your targets.  
       
     By first **validating your cost assumptions** and then **actively steering** orders into the right modes, KMS can both **improve service** for high‐priority customers and **drive down freight expense** on lower‐priority shipments.