CONSUMER GOODS AD_HOC INSIGHTS

Company Name : ATLIQ HARDWARES

Presented by Sankalp Anand

ABOUT COMPANY

Atliq Hardwares is an imaginary portrayal of a thriving computer hardware manufacturer with a robust presence both in India and internationally.

Their commitment to innovation and top-notch quality has positioned them as a leader in the industry.

Yet, they recognize that staying ahead in the game requires having accurate data and valuable insights readily available.

ABOUT CHALLENGE

Tony Sharma, the Director of Data Analytics, is taking a strategic approach to identify candidates who possess a blend of technical prowess and essential soft skills.

He has introduced a SQL challenge aimed at gauging the capabilities of potential junior data analysts.

Through this initiative, the company aims to ensure that prospective team members not only excel in technical competence but also demonstrate the interpersonal and problem-solving skills essential for success in the organization.

ABOUT DATA

The "atliq_hardware_db" database comprises six distinct tables, each housing pivotal data crucial for comprehensive analysis. These tables collectively offer invaluable insights into various aspects, including customer details, product information, sales records, costs, and other pertinent data essential for informed decision-making.

Following are the six main tables :

- dim_customer: contains customer-related data
- dim_product: contains product-related data
- fact_gross_price: contains gross price information for each product
- fact_manufacturing_cost: contains the cost incurred in the production of each product
- fact_pre_invoice_deductions: contains pre-invoice deductions information for each product
- fact_sales_monthly: contains monthly sales data for each product.

Request - 1

Provide the list of markets in which customer "Atliq Exclusive" operates its business in the APAC region.

QUERY

```sql
SELECT market, customer, region

FROM dim_customer

WHERE customer = "Atliq Exclusive" AND region = "APAC";
```

RESULT

market	customer	region
Australia	Atliq Exclusive	APAC
Bangladesh	Atliq Exclusive	APAC
India	Atliq Exclusive	APAC
India	Atliq Exclusive	APAC
Indonesia	Atliq Exclusive	APAC
Japan	Atliq Exclusive	APAC
Newzealand	Atliq Exclusive	APAC
Philiphines	Atliq Exclusive	APAC
South Korea	Atliq Exclusive	APAC

INSIGHTS

- In the observed data, 'India' is uniquely represented twice, unlike other countries in the APAC region, each of which is accounted for once.
- This discrepancy arises from the fact that the 'India' market encompasses two distinct channels: Direct and Retailer.
- In contrast, the remaining APAC countries exclusively utilize either the Direct or Retailer channel.

Request - 2

What is the percentage of unique product increase in 2021 vs. 2020?

The final output should contain the following fields:

1. unique_products_2020 2. unique_products_2021 3. percentage_chg

QUERY – 1/3

```sql
WITH CTE_20 AS
(
SELECT COUNT(DISTINCT dp.product_code) AS Unique_Product_2020

FROM dim_product dp
JOIN fact_sales_monthly fsm
ON dp.product_code = fsm.product_code

WHERE fsm.fiscal_year = 2020
),
```

calculating the count of distinct product codes for the fiscal year 2020

QUERY – 2/3

```
CTE_21 AS
(
SELECT COUNT(DISTINCT dp.product_code) AS Unique_Product_2021

FROM dim_product dp
JOIN fact_sales_monthly fsm
ON dp.product_code = fsm.product_code

WHERE fiscal_year = 2021
)
```

calculating the count of distinct product codes for the fiscal year 2021

QUERY – 3/3

```
SELECT
    Unique_Product_2020, Unique_Product_2021,
    ROUND(((Unique_Product_2021 - Unique_Product_2020) / Unique_Product_2020) * 100, 2) AS Percentage_Chg

FROM CTE_20
JOIN CTE_21
ON 1 = 1
```

Calculating the percentage change between the counts

RESULT

Unique_Product_2020	Unique_Product_2021	Percentage_Chg
245	334	36.33

INSIGHTS

- The analysis indicates a noteworthy increase in the count of unique products, rising from 245 in 2020 to 334 in 2021.
- This represents a substantial 36% change over the observed period.
- This growth in product diversity suggests a dynamic and expanding product portfolio, potentially indicative of strategic initiatives, market responsiveness, or innovation within the analyzed timeframe.

Request - 3

Provide a report with all the unique product counts for each segment and sort them in descending order of product counts. The final output contains the following two fields :

1. segment 2. product_count

QUERY

```sql
SELECT
    segment,
    COUNT(DISTINCT product_code) AS product_count

FROM dim_product

GROUP BY segment
ORDER BY product_count DESC;
```

RESULT

segment	product_count
Notebook	129
Accessories	116
Peripherals	84
Desktop	32
Storage	27
Networking	9

INSIGHTS

- Atliq Exclusive's product sales analysis reveals notable disparities among its various segments.
- The Notebook and Accessories categories emerge as the frontrunners, demonstrating the highest sales figures within the product portfolio.
- This highlights a robust market demand and consumer preference for these particular offerings.
- Conversely, the Networking segment lags behind, experiencing comparatively lower sales.
- This suggests a potential area for improvement or strategic reevaluation within the company's marketing approach to enhance the performance of the Networking segment.

Request - 4

Which segment had the most increase in unique products in 2021 vs 2020?

The final output contains these fields:

1. segment 2. product_count_2020 3. product_count_2021 4. difference

QUERY – 1/3

```
WITH CTE_20 AS
(
SELECT
  DISTINCT(segment) AS Segment,
  COUNT(DISTINCT dp.product_code) AS Product_count_2020

FROM dim_product dp
JOIN fact_sales_monthly fsm
ON dp.product_code = fsm.product_code

WHERE fsm.fiscal_year = 2020
GROUP BY segment
ORDER BY segment ),
```

calculating the count of distinct products in each segment for the fiscal year 2020

QUERY – 2/3

```
CTE_21 AS
(
SELECT
  DISTINCT(segment) AS Segment,
  COUNT(DISTINCT dp.product_code) AS Product_count_2021

FROM dim_product dp
JOIN fact_sales_monthly fsm
ON dp.product_code = fsm.product_code

WHERE fiscal_year = 2021
GROUP BY segment
ORDER BY segment )
```

calculating the count of distinct products in each segment for the fiscal year 2021

QUERY – 3/3

```sql
SELECT
    CTE_20.Segment,
    Product_count_2020, Product_count_2021,
    (Product_count_2021 - Product_count_2020) AS Difference

FROM CTE_20
JOIN CTE_21
ON CTE_20.Segment = CTE_21.Segment

ORDER BY Difference DESC
```

Joining the two CTEs in the segment to compare the product counts between the two years.

RESULT

	Segment	Product_count_2020	Product_count_2021	Difference
▶	Accessories	69	103	34
	Notebook	92	108	16
	Peripherals	59	75	16
	Desktop	7	22	15
	Storage	12	17	5
	Networking	6	9	3

INSIGHTS

- The Notebook and Accessories product segments at Atliq Exclusive have shown significant growth in sales from 2020 to 2021.
- Conversely, the Networking segment has experienced a notable 50% increase in product count during the same period.
- This data suggests a positive trend in consumer demand for Notebook and Accessories products, while also highlighting the expanding market presence of Networking segment offerings.

Request - 5

Get the products that have the highest and lowest manufacturing costs.

The final output should contain the following three fields :

1. product_code 2. product 3. manufacturing_cost

QUERY

```sql
SELECT
    dp.product_code, dp.product,
    fmc.manufacturing_cost AS COST

FROM dim_product dp
JOIN fact_manufacturing_cost fmc
ON dp.product_code = fmc.product_code

WHERE
fmc.manufacturing_cost =
( SELECT min(manufacturing_cost) FROM fact_manufacturing_cost )
OR
fmc.manufacturing_cost =
( SELECT max(manufacturing_cost) FROM fact_manufacturing_cost )

ORDER BY manufacturing_cost DESC;
```

The query retrieves information about products from the "dim_product" table and their corresponding manufacturing costs from the "fact_manufacturing_cost" table.

It filters the results to include only those rows where the manufacturing cost is either the minimum or maximum in the "fact_manufacturing_cost" table and presents the results in descending order of manufacturing cost.

RESULT

product_code	product	COST
A6120110206	AQ HOME Allin1 Gen 2	240.5364
A2118150101	AQ Master wired x1 Ms	0.8920

Request - 6

Generate a report that contains the top 5 customers who received an average high pre_invoice_discount_pct for the fiscal year 2021 and in the Indian market.

The final output contains the following fields :

1. customer_code 2. customer 3. average_discount_percentage

QUERY

```sql
SELECT
    dc.customer_code,
    customer,
    round(avg(fpid.pre_invoice_discount_pct)*100,  2) AS avg_discount_percentage

FROM dim_customer dc
JOIN fact_pre_invoice_deductions fpid

ON dc.customer_code = fpid.customer_code

WHERE fpid.fiscal_year = 2021 AND dc.market = 'India'

GROUP BY dc.customer_code, dc.customer

ORDER BY avg_discount_percentage DESC

LIMIT 5
```

RESULT

customer_code	customer	avg_discount_percentage
90002009	Flipkart	30.83
90002006	Viveks	30.38
90002003	Ezone	30.28
90002002	Croma	30.25
90002016	Amazon	29.33

INSIGHTS

- Flipkart is identified as the customer of Atliq Exclusive which has received the highest average pre-invoice discount of 30.83% in the fiscal year 2021.

- Four other customers, aside from Flipkart, received approximately similar pre-invoice discounts, for the same fiscal year, showing a competitive landscape in terms of discounts among these customers.

- The data suggests that pre-invoice discounts are a significant factor in the Indian market. Atliq Exclusive can evaluate its pricing strategies and negotiate terms to maintain competitiveness in the market.

Request - 7

Get the complete report of the Gross sales amount for the customer “Atliq Exclusive” for each month. This analysis helps to get an idea of low and high-performing months and make strategic decisions. The final report should contain the following columns :

1. Month 2. Year 3. Gross sales Amount

QUERY

```sql
SELECT
        MONTH(fsm.date) AS Month_, YEAR(fsm.date) AS Year_,
        round(SUM(fgp.gross_price * fsm.sold_quantity)/100000, 2) AS Gross_Sales_Million

FROM fact_sales_monthly fsm
JOIN fact_gross_price fgp
ON fgp.product_code = fsm.product_code

JOIN dim_customer dc
ON fsm.customer_code = dc.customer_code

WHERE dc.customer = 'Atliq Exclusive'

GROUP BY MONTH(fsm.date), YEAR(fsm.date)

ORDER BY Year_, Month_
```

Calculating the ‘gross sales’ by multiplying the ‘gross price’ with the ‘sold quantity’, summing up the results, and then dividing by 100,000.

Then rounding the result to 2 decimal places and aliases it as Gross_Sales_Million.

RESULT

	Month_	Year_	Gross_Sales_Million
▶	9	2019	90.93
	10	2019	103.79
	11	2019	152.32
	12	2019	97.56
	1	2020	95.85
	2	2020	80.84
	3	2020	7.67
	4	2020	8.00
	5	2020	15.87
	6	2020	34.30
	7	2020	51.52
	8	2020	56.38

Fiscal Year 2020

	Month_	Year_	Gross_Sales_Million
▶	9	2020	195.30
	10	2020	210.16
	11	2020	322.47
	12	2020	204.09
	1	2021	195.71
	2	2021	159.87
	3	2021	191.50
	4	2021	114.84
	5	2021	192.04
	6	2021	154.58
	7	2021	190.45
	8	2021	113.25

Fiscal Year 2021

INSIGHTS

- During the fiscal years 2020 and 2021, an analysis of sales data reveals notable trends in monthly ‘Gross Sales’.
- Specifically, months 9 through 12 consistently exhibited the highest gross sales for both fiscal years.
- This surge in sales during this period may be attributed to various factors such as festivals, weddings, and year-end promotions, among others.
- Conversely, months 3, 4, and 5 of the fiscal year 2020 stand out with significantly lower sales compared to the remaining months.
- This downturn in sales during this period can be directly correlated with the adverse impact of the COVID-19 pandemic, which adversely affected consumer behavior and economic activities during that time.

Request - 8

In which quarter of 2020, there was a maximum total_sold_quantity?

The final output contains these fields sorted by the total_sold_quantity:

1. Quarter_No 2. total_sold_quantity

QUERY

```
SELECT

    CASE
        WHEN fsm.date BETWEEN '2019-09-01' AND '2019-11-30' THEN 'Q1'
        WHEN fsm.date BETWEEN '2019-12-01' AND '2020-02-28' THEN 'Q2'
        WHEN fsm.date BETWEEN '2020-03-01' AND '2020-05-31' THEN 'Q3'
        ELSE 'Q4'
    END AS Quarter_No,

    SUM(sold_quantity) AS Total_Sold_Quantity

FROM fact_sales_monthly fsm

WHERE fiscal_year = 2020

GROUP BY Quarter_No

ORDER BY Total_Sold_Quantity DESC
```

RESULT

	Quarter_No	Total_Sold_Quantity
▶	Q1	7005619
	Q2	6649642
	Q4	5042541
	Q3	2075087

Request - 9

Which channel helped to bring more gross sales in the fiscal year 2021 and the percentage of contribution? The final output should contain the following fields :

1. channel 2. gross_sales_mln 3. percentage

QUERY 1/2

```
WITH CTE_1 AS
(
SELECT
    dc.channel,
    ROUND(SUM(fgp.gross_price * fsm.sold_quantity)/100000, 2) AS Gross_Sales_Million

FROM fact_sales_monthly fsm
JOIN dim_customer dc
ON fsm.customer_code = dc.customer_code

JOIN fact_gross_price fgp
ON fsm.product_code = fgp.product_code

WHERE fsm.fiscal_year = 2021

GROUP BY dc.channel

ORDER BY Gross_Sales_Million DESC
),
```

- **CTE_1 retrieves data related to gross sales for each channel in the year 2021.**
- **It selects the channel and the rounded sum of the product of gross price and sold quantity divided by 100,000 and alias as "Gross_Sales_Million."**
- **The result is grouped by the channel and ordered by the calculated gross sales in descending order.**

QUERY – 2/2

```
CTE_2 AS
(
SELECT SUM(Gross_Sales_Million) AS Total_Pct

FROM CTE_1
)

SELECT
    CTE_1.*,
    round((CTE_1.Gross_Sales_Million / CTE_2.Total_Pct)*100, 2) AS percentage

FROM CTE_1
JOIN CTE_2 ;
```

- **CTE_2 calculates the total sum of "Gross_Sales_Million" from CTE_1 and names it as "Total_Pct."**

- **The main query selects data from CTE_1 and calculates the percentage of each channel's gross sales in relation to the total gross sales.**

- **It selects all columns from CTE_1 and adds a new column named "percentage."**

RESULT

	channel	Gross_Sales_Million	percentage
▶	Retailer	19241.70	73.22
	Direct	4066.87	15.47
	Distributor	2971.76	11.31

INSIGHTS

- In fiscal year 2021, the 'Retailer' channel emerged as the most lucrative avenue for 'Atliq Exclusive,' delivering a substantial 74% of the total gross sales.
- This indicates a noteworthy dependence on the Retailer channel for revenue generation.
- Conversely, the 'Direct' and 'Distributor' channels demonstrated a balanced performance, contributing nearly equal proportions to the overall gross sales.
- This suggests a more evenly distributed impact from these two channels on the company's sales landscape.

Request - 10

Get the Top 3 products in each division that have a high total_sold_quantity in the fiscal_year 2021. The final output should contain the following fields :

1. division 2. product_code 3. product 4. total_sold_quantity 5. rank_order

QUERY 1/3

```
WITH CTE_1 AS
(
SELECT
    dp.division, dp.product_code, dp.product,
    SUM(fsm.sold_quantity) AS Total_Sold_Quantity

FROM dim_product dp
JOIN fact_sales_monthly fsm

ON dp.product_code = fsm.product_code

WHERE fsm.fiscal_year = 2021

GROUP BY dp.division, dp.product_code, dp.product

ORDER BY Total_Sold_Quantity DESC ),
```

- **Calculating the total sold quantity for each group using the SUM function in the fiscal year 2021**
- **Ordering the result set by the total sold quantity in descending order.**

QUERY – 2/3

```
CTE_2 AS
(
SELECT
    *,
    dense_rank() over ( PARTITION BY division ORDER BY Total_Sold_Quantity DESC) AS Rank_Order

FROM CTE_1
)
```

- **Adding a new column called Rank_Order using the dense_rank() window function.**
- **The dense_rank() function will assign a rank to each row within a partition (group) based on the total sold quantity in descending order. The partition is determined by the division.**
- **The result is the ranking of each product within its division based on the total sold quantity.**

QUERY – 3/3

```
SELECT *

FROM CTE_2

WHERE Rank_Order <= 3
```

- **Selecting all the columns from CTE_2.**
- **Filtering the results to include only rows where the Rank_Order is less than or equal to 3.**

RESULT

division	product_code	product	Total_Sold_Quantity	Rank_Order
N & S	A6720160103	AQ Pen Drive 2 IN 1	701373	1
N & S	A6818160202	AQ Pen Drive DRC	688003	2
N & S	A6819160203	AQ Pen Drive DRC	676245	3
P & A	A2319150302	AQ Gamers Ms	428498	1
P & A	A2520150501	AQ Maxima Ms	419865	2
P & A	A2520150504	AQ Maxima Ms	419471	3
PC	A4218110202	AQ Digit	17434	1
PC	A4319110306	AQ Velocity	17280	2
PC	A4218110208	AQ Digit	17275	3

INSIGHTS

- Both the "AQ Pen Drive DRC Plus" and "AQ Pen Drive DRC Premium" variants are top performers in terms of total sales within the N & S segment.
  This suggests that offering product variants can be beneficial, as it caters to different customer preferences or needs.

- The standout success of the "Standard 1" and "Plus 2" variants within the "AQ Maxima Ms" product line not only signals high-performance models but also presents an opportunity to finely tune inventory levels and craft offerings that align precisely with the distinctive tastes and requirements of customer base.

- The observation that "AQ Digit" and "AQ Velocity" in the PC segment fall under the category of 'personal laptops' is noteworthy. The notable surge in sales of personal laptops during fiscal year 2021 strongly implies the influence of the prevailing paradigm shift, commonly referred to as the "Work From Home" (WFH) trend.

- The above-mentioned trend seems to have gained momentum as a direct response to the adverse effects of the COVID-19 pandemic in 2020.

THANK - YOU