Atliq Hardware Report(Based on Adhoc_requests)

Problem Statement

Atliq Hardware (imaginary company) is one of the leading computer hardware producers in India and has well-established operations in other countries too.

However, the management noticed that they did not get enough insights to make quick and smart data-informed decisions. They want to expand their data analytics team by adding several junior data analysts. Tony Sharma, their data analytics director, wanted to hire someone who is good at both tech and soft skills. Hence, he decided to conduct a SQL challenge, which will help him understand both skills.

Domain: Consumer Goods | **Function**: Executive Management

Task

- There are 10 ad hoc requests for which the business needs insights.

  Management has given the ad-hoc file, which contains 10 detailed requests.

  ad-hoc-requests.pdf

- Run a SQL query to answer these requests.
- Create a detailed report with insight and output based on requests.

Approach

1. Understanding Business Problem
2. Data Understanding
3. Build a Connection with the Database system
4. Build Data Model Based on data tables
5. SQL Query Analysis
6. Report Generation

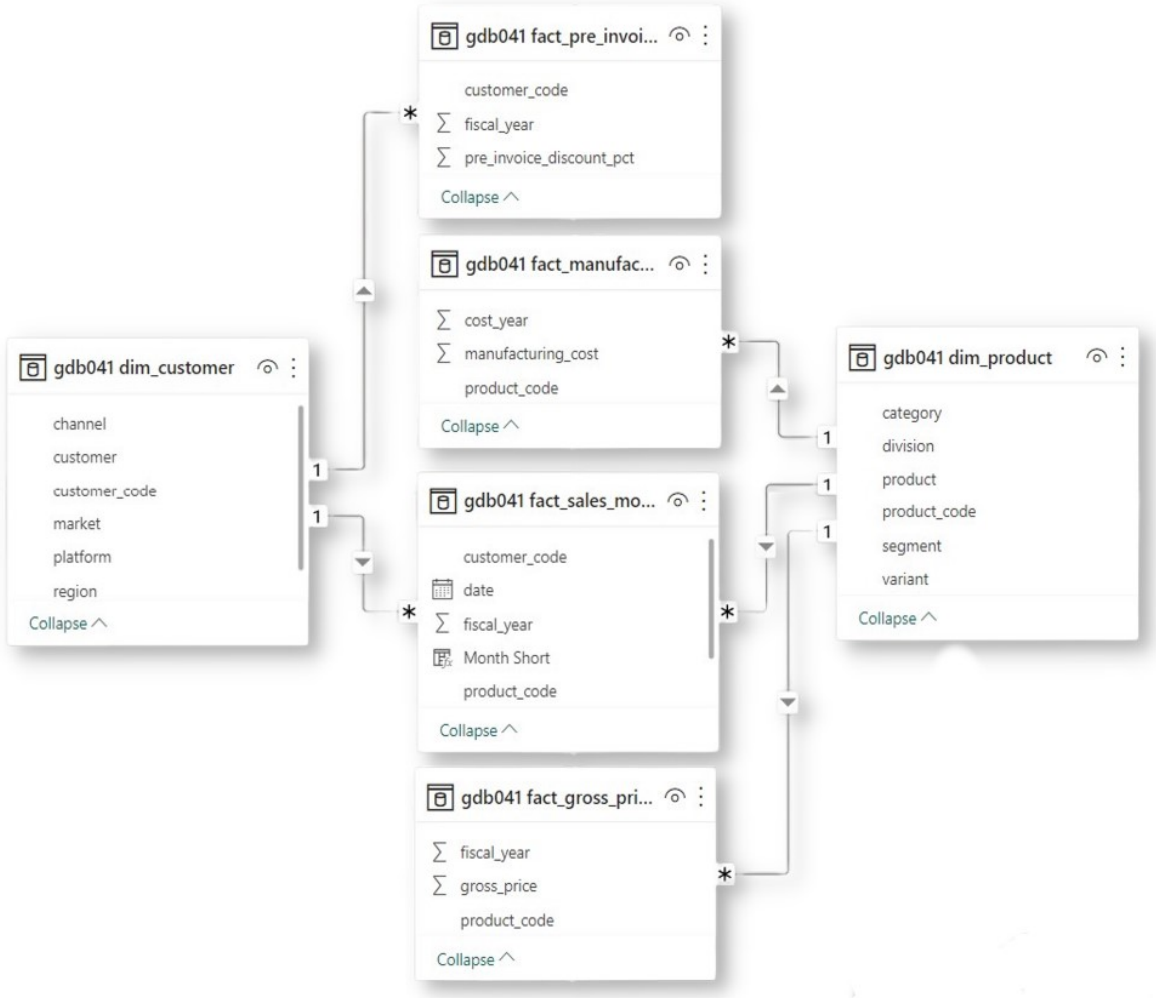
Database:- atliq_Hardware_db

Tools used:- Mysql Workbench, Notion

Tables

1. dim_product:- contains product-related data
2. fact_gross_price:- contains gross price information for each product
3. fact_manufacturing:-_cost: contains the cost incurred in the production of each product
4. fact_pre_invoice_deductions:- contains pre-invoice deductions information for each product
5. fact_sales_monthly:- contains monthly sales data for each product.

Data Model



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

Query:-

```
SELECT market
FROM dim_customer
WHERE customer='Atliq Exclusive' AND region = 'APAC';
```

Output:-

market
India
Indonesia
Japan
Philiphines
South Korea
Australia
Newzealand
Bangladesh

2. **What is the percentage of unique product increase in 2021 vs. 2020? The final output contains these fields,**
   unique_products_2020
   unique_products_2021
   percentage_chg.

Query:-

```
WITH product_count_2020 AS (
SELECT COUNT(DISTINCT product_code) AS unique_products_2020
FROM fact_sales_monthly
WHERE fiscal_year = 2020
),
product_count_2021 AS (
SELECT COUNT(DISTINCT product_code) AS unique_products_2021
FROM fact_sales_monthly
WHERE fiscal_year = 2021
)

SELECT
pc_2020.unique_products_2020,
pc_2021.unique_products_2021,
ROUND((pc_2021.unique_products_2021 - pc_2020.unique_products_2020) * 100.0 / pc_2020.unique_products_2020, 2) AS percentage_chg
FROM
product_count_2020 pc_2020,
product_count_2021 pc_2021;
```

Output:-

	unique_products_2020	unique_products_2021	percentage_chg
▶	245	334	36.33

Insight:-

Product has significantly increased in the Atliq Warehouse by 36%. It means demand is high.

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 2 fields,

segment
product_count

Query:-

```
SELECT segment,
count(distinct product_code) AS product_count
FROM
dim_product
GROUP BY segment
ORDER BY product_count DESC;
```

Output:-

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

Insight:-

The notebook has the highest number of unique products. **80%** of the products constitute notebooks, accessories, and peripherals. Need to focus on desktop, storage, and Networking segments.

4. **Which segment had the most increase in unique products in 2021 vs 2020? The final output contains these fields:-**
   segment
   product_count_2020
   product_count_2021
   difference

Query:-

```
WITH unique_product_2020 AS (
SELECT
dim_product.segment,
COUNT(DISTINCT fact_sales_monthly.product_code) AS product_count_2020
FROM
fact_sales_monthly,
dim_product
WHERE
fact_sales_monthly.product_code = dim_product.product_code
AND fiscal_year = 2020
GROUP BY
dim_product.segment
),
unique_product_2021 AS (
SELECT
dim_product.segment,
COUNT(DISTINCT fact_sales_monthly.product_code) AS product_count_2021
FROM
fact_sales_monthly,
dim_product
WHERE
fact_sales_monthly.product_code = dim_product.product_code
AND fiscal_year = 2021
GROUP BY
dim_product.segment
)
```

```
SELECT
uc_2020.segment,
uc_2020.product_count_2020,
uc_2021.product_count_2021,
(uc_2021.product_count_2021 - uc_2020.product_count_2020) AS difference
FROM
unique_product_2020 uc_2020,
unique_product_2021 uc_2021
WHERE uc_2020.segment = uc_2021.segment
ORDER BY difference DESC;
```

Output:-

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

Insight:-

We have Accessories, Notebooks, and Peripherals in demand. The unique product count has significantly increased in production storage and networking have very low production.

5. Get the products that have the highest and lowest manufacturing costs.The final output should contain these fields:-
product_code
product
manufacturing_cost

Query:-

```
select pr.product_code,pr.product,ma.manufacturing_cost
from dim_product pr,fact_manufacturing_cost ma
where pr.product_code = ma.product_code
and ma.manufacturing_cost In (
select max(manufacturing_cost) from fact_manufacturing_cost
Union
Select min(manufacturing_cost) from fact_manufacturing_cost
)
order by ma.manufacturing_cost desc ;
```

Output:-

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

6. Generate a report which 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 these fields:-
customer_code

customer
average_discount_percentage

Query:-

```
SELECT c.customer_code,
c.customer,
pid.pre_invoice_discount_pct AS average_discount_pct
FROM dim_customer c, fact_pre_invoice_deductions pid
WHERE
c.customer_code = pid.customer_code
AND pid.fiscal_year = 2021 AND c.market= 'India'
AND pid.pre_invoice_discount_pct > (SELECT AVG(pre_invoice_discount_pct) FROM fact_pre_invoice_deductions)
ORDER BY average_discount_pct DESC
LIMIT 5;
```

Output:-

customer_code	customer	average_discount_pct
90002009	Flipkart	0.3083
90002006	Viveks	0.3038
90002003	Ezone	0.3028
90002002	Croma	0.3025
90002016	Amazon	0.2933

Insight:-

The maximum average pre-invoice discount we have given to Flipkart and the least average discount goes to Amazon in FY 2021 These are the top 5 customers in India with a high avg pre-invoice discount.

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 take strategic decisions.
The final report contains these columns:
Month
Year
Gross sales Amount

Query:-

```
WITH report AS
(
select monthname(sm.date) as 'Month',year(sm.date) as 'year',
round(sum(gp.gross_price*sm.sold_quantity),2) as gross_sales
from fact_sales_monthly sm
Join dim_customer c
ON sm.customer_code = c.customer_code
JOIN fact_gross_price gp
ON sm.product_code = gp.product_code
where c.customer = 'Atliq Exclusive'
group by Month,year
order by Month,year
)

select Month,year,gross_sales from report
where gross_sales In
(Select max(gross_sales) from report
Union
Select min(gross_sales) from report
)
order by year desc;
```

Output:-

Month	year	gross_sales
November	2020	32247289.79
March	2020	766976.45

Gross sales Report

Month	year	gross_sales
December	2019	9755795.06
November	2019	15231894.97
October	2019	10378637.60
September	2019	9092670.34
April	2020	800071.95
August	2020	5638281.83
December	2020	20409063.18
February	2020	8083995.55
January	2020	9584951.94
July	2020	5151815.40
June	2020	3429736.57
March	2020	766976.45
May	2020	1586964.48
November	2020	32247289.79
October	2020	21016218.21
September	2020	19530271.30
April	2021	11483530.30
August	2021	11324548.34
February	2021	15986603.89

Insight:-

Based on the above observation, We found that **November** is the month where gross sales were high and **March** was low sales in 2020 for **"Atliq Exclusive"**.

8. In **which quarter of 2020, got the maximum total_sold_quantity? The final output contains these fields sorted by the total_sold_quantity,**
Quarter
total_sold_quantity.
Note that fiscal_year for Atliq Hardware starts from September(09)
if the fiscal year (FY) starts on September 1, 2019, the end date for the first quarter would typically be November 30, 2019.

Query:-

```
SELECT
CASE
WHEN date BETWEEN '2019-09-01' and '2019-11-01' THEN 1
WHEN date BETWEEN '2019-12-01' and '2020-02-01' THEN 2
WHEN date BETWEEN '2020-03-01' and '2020-05-01' THEN 3
WHEN date BETWEEN '2020-06-01' and '2020-08-01' THEN 4
END AS Quarters,
sum(sold_quantity) AS total_sold_quantity
FROM fact_sales_monthly
WHERE fiscal_year = 2020
GROUP BY Quarters
ORDER BY total_sold_quantity desc;
```

Output:-

Quarters	total_sold_quantity
1	7005619
2	6649642
4	5042541
3	2075087

Insight:-

In the 1st Q1 of FY 2020, we sold 7M(70 lakhs) quantity which is quite high among others quarters.Q3 measured very low quantity sold.

9. Which channel helped to bring more gross sales in the fiscal year 2021 and the percentage of contribution? The final output contains these fields,
channel
gross_sales_mln
percentage

Query:-

```
WITH Output AS
(
SELECT c.channel AS 'Channel',
ROUND(SUM(gp.gross_pricesm.sold_quantity/1000000),2) AS gross_sales_mln
FROM fact_sales_monthly sm
JOIN fact_gross_price gp
ON  sm.product_code = gp.product_code
Join dim_customer c
ON sm.customer_code = c.customer_code
WHERE sm.fiscal_year = 2021
GROUP BY c.channel
)


select Channel, gross_sales_mln,
Concat(round(gross_sales_mln*100/total,2),'%')as percentage
from
(
(select sum(gross_sales_mln) as total from Output) A,
(select * from Output ) B
)
order by percentage desc;
```

Output:

Channel	gross_sales_mln	percentage
Retailer	1924.17	73.22%
Direct	406.69	15.48%
Distributor	297.18	11.31%

Insight:-

The **retailer(1924.17 M)** is one of the major channels that brought **~74%** of sales which is quite high when compared with others. The distributor brought low sales.

10. Get the Top 3 products in each division that have a high total_sold_quantity in the fiscal_year 2021? The final output contains these fields:-
division
product_code
product
total_sold_quantity
rank_order

Query:-

```
SELECT division, product_code, product, total_sold_quantity, rank_order
FROM (
SELECT
p.division,
p.product_code,
product,
SUM(sm.sold_quantity) AS total_sold_quantity,
RANK() OVER (PARTITION BY p.division ORDER BY SUM(sm.sold_quantity) DESC) AS rank_order
FROM
dim_product p
JOIN
fact_sales_monthly sm ON p.product_code = sm.product_code
WHERE
sm.fiscal_year = 2021
GROUP BY
p.division, p.product_code, product
) ranked_products
WHERE rank_order <= 3;
```

Output:-

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

Insight:-

From the above observation, We found that every division has the top 3 similar kinds of product with their different variant which is being sold.