**Ecommerce Trends and Efficiency (2019-2022)**

Project Introduction:

This project involves the analysis of sales trends and operational performance for an ecommerce business trading primarily in consumer electronics and electronic peripherals.

I was tasked with generating insights to answer four key questions prior to a company-wide townhall meeting on the state of the business. The email prompt I received from my direct report was as follows:

A screenshot of a computer

Description automatically generated with low confidence

**Key Takeaways and Key insights:**

1. **Product Mix**

Three products (desktop monitors, Bluetooth headphones, and Mac laptops) make up 85% of revenue and 70% of all orders, suggesting that comparable in-class products should be researched for possible addition to inventory, i.e., additional desktop dimension options, Samsung-compatible Bluetooth headphones, and alternate laptop products.

1. **Sales Performance and Loyalty**

While revenue and order counts are below 2019 performance, loyalty program participants now represent most of the revenue (56% in ‘22, up from 10% in ‘19) and order counts (52% in ‘22, up from 11% in ‘19). Loyalty program participants also show better resistance to downward trends in annual spend and annual order counts.

Loyalty members are twice as responsive to email campaigns as non-loyalty members in the company’s four largest markets. This gives the company an opportunity to drive future sales with targeted email campaigns.

Loyalty Members request refunds 3.4% more often than non-loyalty members. This suggests they are more willing to take a chance on products through our company and should be targeted when new products are added to the inventory.

1. **Sales Channels and Customer Device Interaction**

Although orders made through the company’s mobile app account for only 3% of revenue due to a low AOV, they account for 25% of all placed orders in the past two years.

Further, revenue generated through mobile device users have increased by an average of 20% year-over-year, suggesting that the mobile app can play a larger role in driving sales through a marketing campaign promoting the mobile app to mobile device users.

**Full Report:**

1 - What were the overall trends in sales for this period?

* The NA market accounts for 52% of revenue over the period of study, followed by EMEA (29%), APAC (13%), and LATAM (6%), with order quantity following the same hierarchy.
* ***So what: Building sales and marketing strategies focused on the NA and EMEA markets will be key to sustained growth.***
* 2020 and 2021 marked the highest annual revenue and order counts for the company. While 2022 Q3/Q4 have shown deep declines in revenue and order counts, annual revenue for 2022 is still 33.7% above 2019, Order Quantity is 32.7% above 2019, and annual AOV has remained stable with 0.7% growth.
* ***So what: Despite recent shortfalls, the company is in a stronger position now than at the start of this period of study. Lessons learned during this period can fuel future growth.***
* Three products (desktop monitors, Bluetooth headphones, and Mac laptops) account for 85% of overall revenue and 70% of all orders.
* ***So what: Expanding our product selection with similar in-class products can drive future revenue by ensuring customers find a product that suits their specific needs.***
* Seasonality: There was no discernable difference in sales performance based on weekend/weekday, with every day accounting for roughly 14.5% of total revenue and orders. Additionally, while Q2 was the strongest quarter in terms of revenue between 2019 and 2022, this is largely due to the surge in sales during Q2 of 2020, when pandemic-related purchasing was highest.
* ***So what: The limited seasonality in sales may be a product of lack of consumer interest based on time of year, or it could suggest that there have been no marketing drives aimed at driving sales around holiday seasons.***
* Although orders made through the company’s mobile app account for only 3% of revenue due to a low AOV, they account for 25% of all placed orders in the past two years.

Further, revenue generated through mobile device users has increased by an average of 20% year-over-year.

* ***So what: A marketing push to promote mobile app use to mobile device users could ride the trend of increased mobile devices spending, improving the performance and ROI on investments in the mobile app.***

**2 - What are our monthly and annual growth rates?**

* Annual Revenue Growth Rate: 36.9%
* Annual Order Growth Rate: 23.4%
* Annual AOV Growth Rate: 2.1%
* Average Monthly Revenue Growth Rate: -0.1%
* Average Monthly Order Growth Rate: -0.5%
* Average Monthly AOV Growth Rate:  0.3%
* ***So what: explosive growth in 2020 has been tempered by a gradual decline in performance during 2021 and greater decline in 2022. While annual sales in 2022 still outperform 2019, strategic steps must be taken to recalibrate sales and marketing to match current trends and preserve gains.***

**3 - How is the Loyalty Program Performing? Should we keep using it?**

* The loyalty program accounted for 9.92% of revenue and 11.24% of all orders in 2019 and has grown to 56.01% of revenue and 52.32% of all orders in 2022. While order counts and revenue began dropping for non-loyalty customers in 2021, it continued to grow for loyalty members during this year, indicating it is somewhat successful in promoting higher lifetime spending. When loyalty revenue began to fall in 2022, it did so at a 6% slower rate than non-loyalty revenue.
* ***So what: The loyalty program has seen consistent year-over-year growth in participants, and participants in the program appear somewhat insulated against revenue, order count, and AOV fluctuations when compared to the general public.***
* Loyalty members are twice as responsive to email campaigns as non-loyalty members in the company’s 4 largest markets. This gives the company an opportunity to drive future sales with targeted email campaigns.
* ***So what: The increased responsiveness to email campaigns from loyalty program participants presents a lever the marketing and sales teams can use to improve sales performance across the four largest regional markets, which represent 94% of global revenue.***
* Since Implementation of the program, loyalty members have shown consistent increase in AOV until 2022, when AOV fell by 0.5% - well within standard deviation.
* ***So what: Steady AOV, combined with loyalty customer responsiveness to email campaigns demonstrates a clear avenue to drive consistent revenue year-over-year.***
* Loyalty Members request refunds 3.4% more often than non-loyalty members.
* ***So what: This suggests that loyalty members are more likely to take a chance on products they may like based on built trust with the company. While refunds cut into revenue due to credit card payment processing, it indicates that loyalty members would be the ideal customer demographic to target when rolling out new products.***

**How Efficient are our operations?**

* **Marketing:** 85% of 2022 revenue came through direct traffic, and 13% came via email blasts, leaving the remaining two percent of revenue to be generated by social media and affiliate links.
* ***So what: Due to the success of the loyalty program and email campaigns targeting these customers, reinvestment in email budgeting paves the clearest path towards revenue growth. Social media and affiliate campaigns should be evaluated based on current budget allotments. If these campaigns cost the company very little, then they can either be left static to generate a small amount of revenue, or increased funding could be used to test their efficacy. If there is a large expenditure on these campaigns, those investments should be reevaluated.***
* **Mobile App ROI:** Although orders made through the company’s mobile app account for only 3% of revenue due to a low AOV, they account for 25% of all placed orders in the past two years.

Further, revenue generated through mobile device users has increased by an average of 20% year-over-year, suggesting that the mobile app can play a larger role in driving sales through a marketing campaign promoting the mobile app to mobile device users.

* ***So what: After a slow start, the mobile app is picking up momentum in terms of driving revenue. Since most resources spent in the mobile app experiment occurred during development, continuing the program can only improve overall ROI on the app. This is particularly true if the growing number of mobile device users can be convinced to install and use the app.***
* **Delivery Operations:** Delivery operations have performed exceptionally well during the period of study, despite supply chain and logistic challenges presented during 2020 and 2021. Across all regions, purchase to delivery intervals are slightly shorter in 2022 than 2019, indicating improvement despite external challenges.
* Purchase-to-ship times were highest in 2019, indicating that internal delivery operations are quite efficient and consistent, at around 2 days. Shipping to delivery times hover around 5.5 days and remain consistent throughout the period of study.
* ***So what: The company performed exceptionally well during the pandemic and may be operating at peak efficiency. Some time should be dedicated to assessing alternate third-party shipping companies to see if shipment-to-delivery intervals can be lowered, improving overall customer experience.***
* **Refund Efficiency:** 6.4% of all purchased items are submitted for a refund. This proportion increases to 8.4% for loyalty members and drops to 5% for non-loyalty members.
* What is most concerning about refund operations is the rate at which high-priced items are returned. 14.4% of ThinkPad Laptops and 13.9% of MacBook Air Laptops are returned by customers regardless of loyalty participation.
* ***So what: Additional customer education and product presentation should be built around high-priced items to lower the risk of refund, in turn lowering the amount of revenue lost to credit card processing fees on returns.***

**Areas for future study**

* This dataset lacked wholesale prices for items. Understanding the margin of each product would greatly aid in providing guidance on future sales strategies to maximize profit.
* Understanding the current spend on social marketing and affiliate link campaigns would provide greater context into ROI for these marketing channels.
* A review of what, if any, marketing efforts have been made globally around holiday seasons would greatly aid in understanding sales seasonality, as quarter-to-quarter performance is rather flat throughout this period of study.