Springboard

Capstone 2 Project
Non-Technical Presentation: Shipping Delay Rates of an E-commerce company

Mary Thorpe

Company and project introduction

Context
An international e-commerce company wants to discover key insights from their customer database. They want to use advanced data analytics techniques to study their customers. The company sells electronic products.

Content
The dataset used for model building contains 10999 observations of 12 variables.

The data contains the following information:

•ID: ID Number of Customers
•Warehouse block: The Company has big Warehouses which is divided in to block such as A,B,C,D,F
•Mode of shipment:The Company Ships the products in multiple way such as Ship, Flight and Road
•Customer care calls: The number of calls made from enquiry for enquiry of the shipment
•Customer rating: The company has rated from every customer. 1 is the lowest (Worst), 5 is the highest (Best)
•Cost of the product: Cost of the Product in US Dollars
•Prior purchases: The Number of Prior Purchases
•Product importance: The company has categorized the product in the various parameter such as low, medium, high
•Gender: Male and Female
•Discount offered: Discount offered on that specific product
•Weight in gms: It is the weight in grams
•Reached on time: It is the target variable, where 1 Indicates that the product has reached on time and 0 indicates it has not reached on time

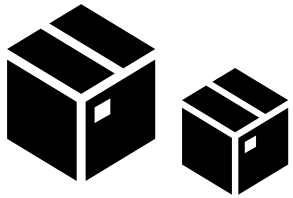
Which **factors** are leading to shipment delays? What strategies could be implemented to reduce shipment delays by 20% in the next two years and what opportunities does the company have to **manage the risks** associated with delayed shipments?

Order is placed and product **importance** is

- High
- Medium
- Low

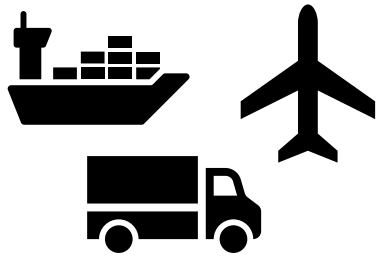
Warehouse fulfills the order

- A
- B
- C
- D
- F



The shipment **weight** varies

- Small
- Regular
- Large
- Extra Large



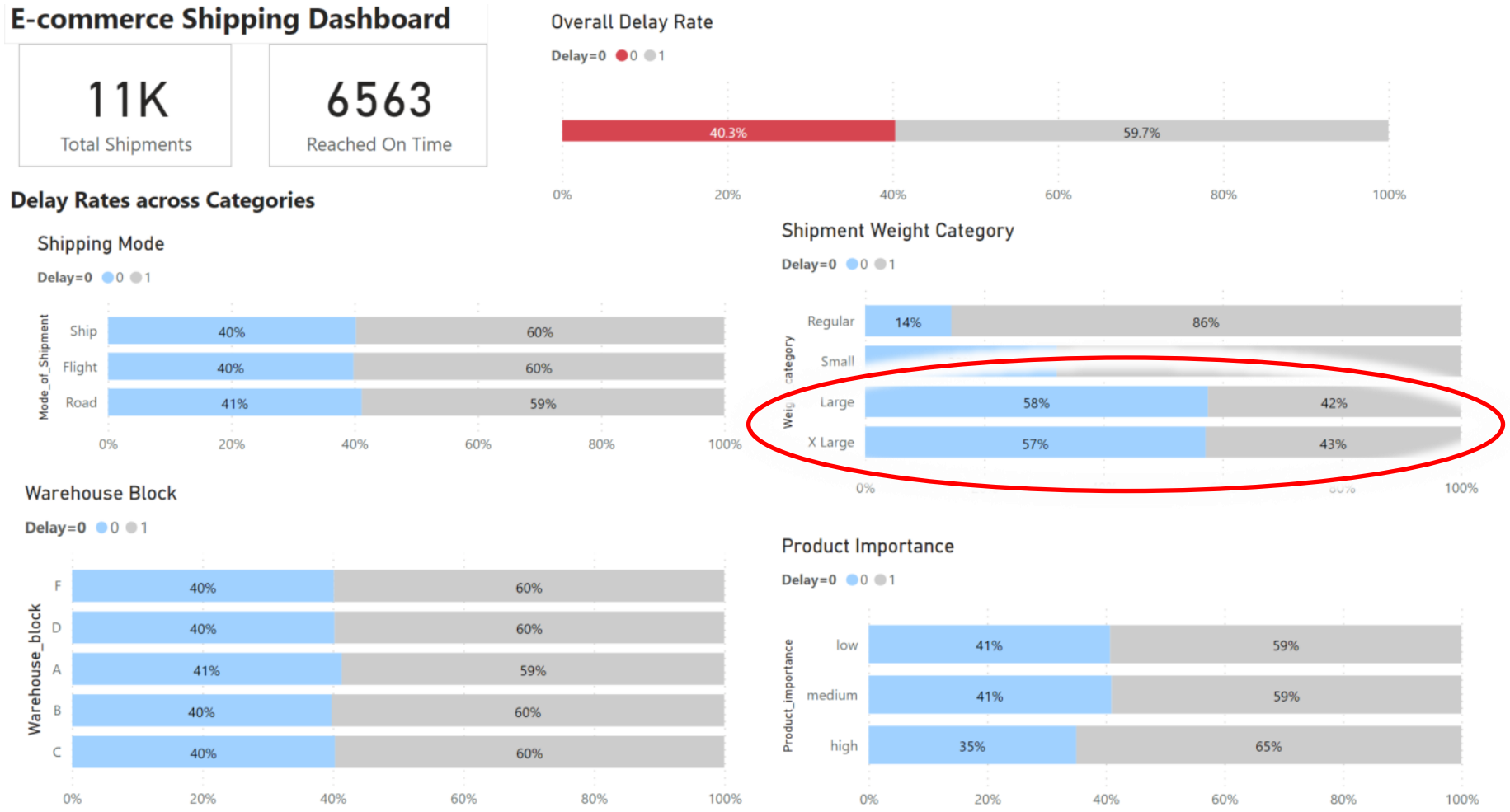
Mode of shipment is

- Ship
- Road
- Flight

Shipment **arrives**

- On-time (1)
- Delayed (0)

Delay rates across categories: rates hover around 40% and further analysis highlights an increased risk of delays of heavier shipments.

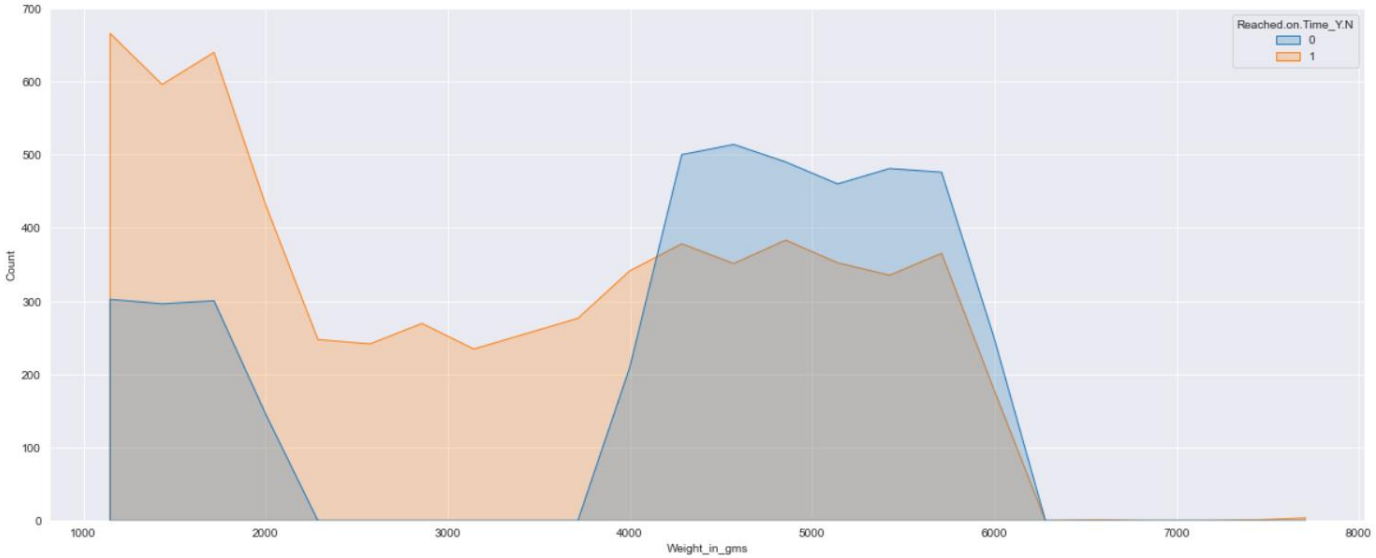


Key Takeaways

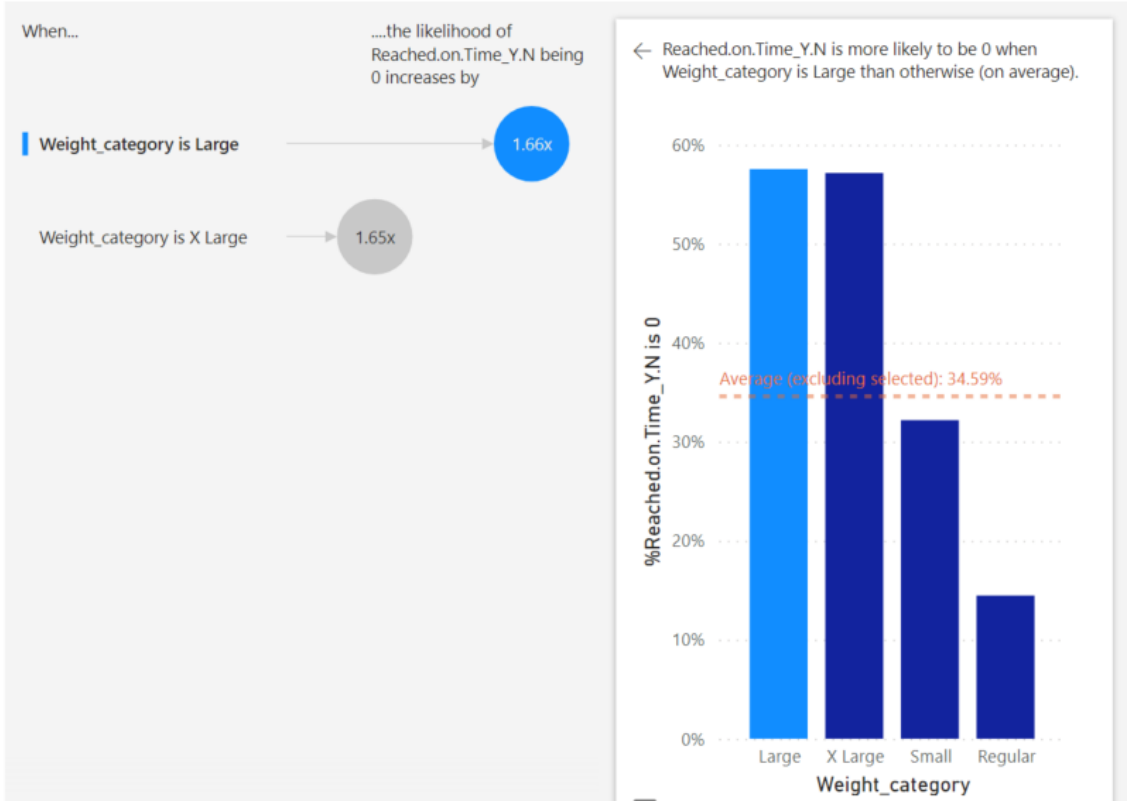
- Evaluate relationship between weight and delayed shipments
- Identify opportunities to minimize delay rates and evaluate business risks associated with delayed shipments

Further investigation into shipment weights reveals shipments over 3800 grams are almost twice as likely to be delayed.

Shipments by Weight, On-Time & Delayed



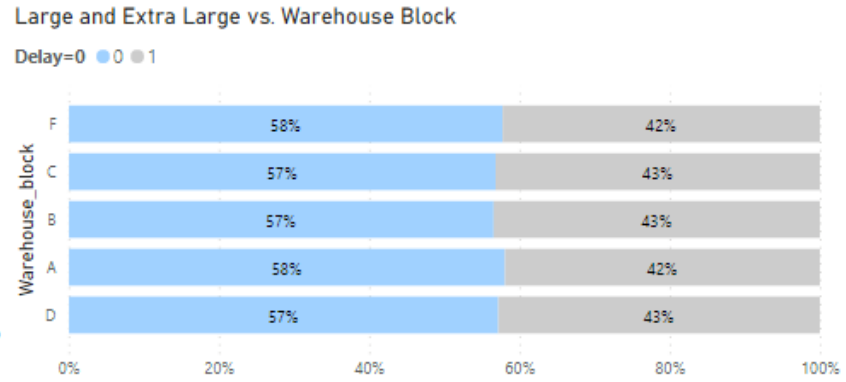
Likelihood for Delay with Heavier Shipments

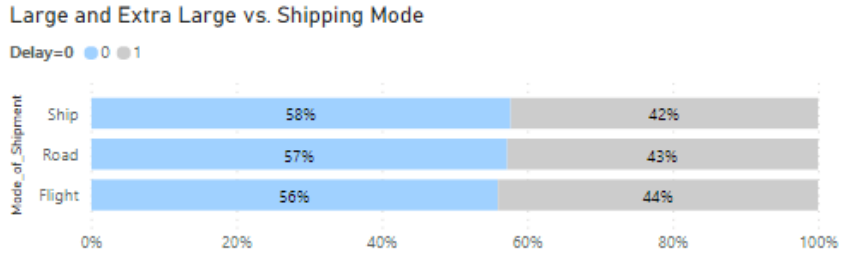


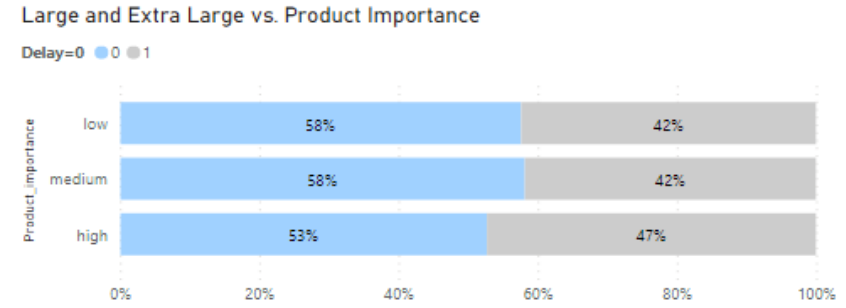
Key Takeaways

- Large and Extra-Large shipments have a higher likelihood of being delayed
- Medium weight shipments are rarely delayed

Analyzing other factors in contribution with heavier shipments, **over half** of heavy shipments are delayed regardless of warehouse, shipping mode or of product importance







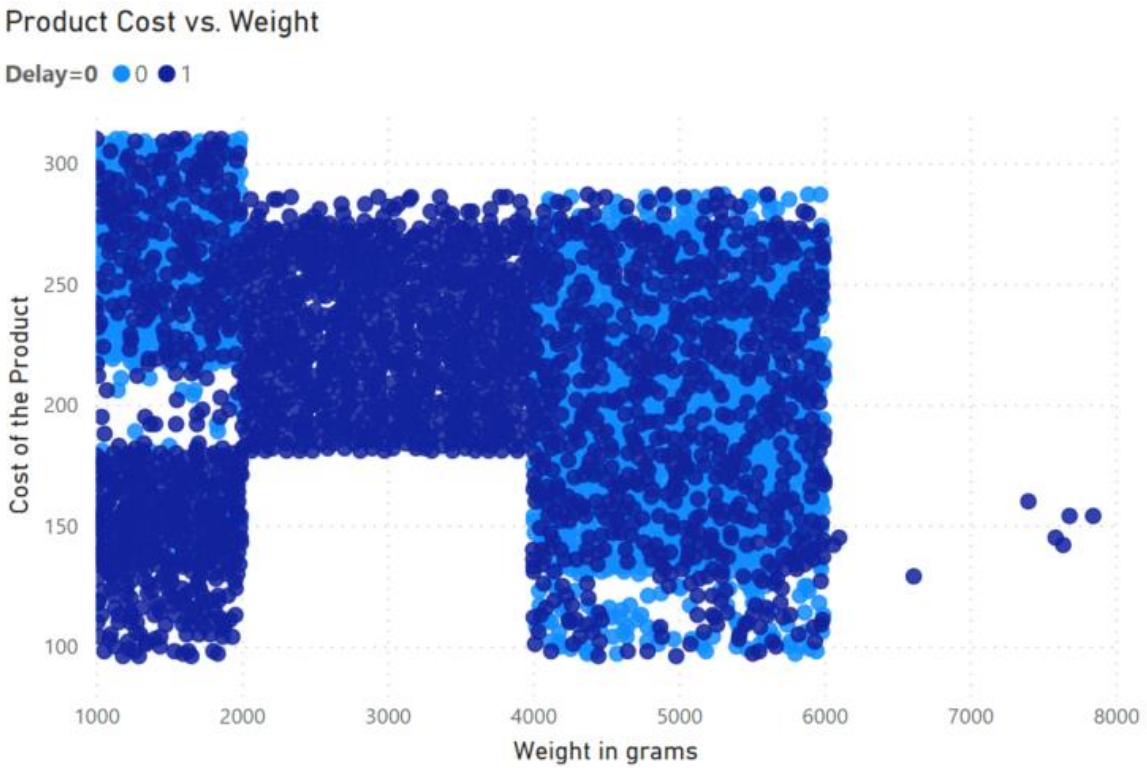
What are the next steps to address high delay rates of heavier shipments?

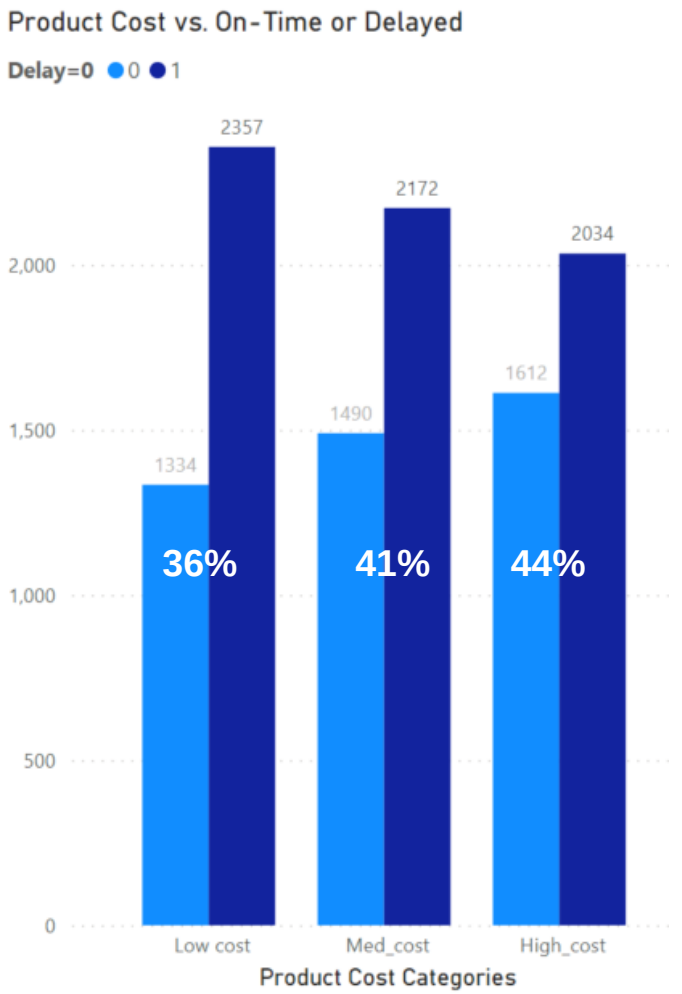
Operational Efficiencies
- Order processing system
- Warehouses properly staffed to move the heavy items
- Inventory management

Increase Visibility
- Sufficient tools to track the shipments to understand **where** the delays occur during the process

Investigate outside carriers
- Which shipping carriers have expertise in heavier shipments and is there an opportunity to outsource or switch the carrier? (in the US, DHL and UPS are the least expensive providers for heavy packages)

Financial implications: to assess risks to revenue based on likelihood of product delays confirms that all heavy shipments are at risk. Notably, higher-cost “small” shipments are also at risk for delayed delivery.





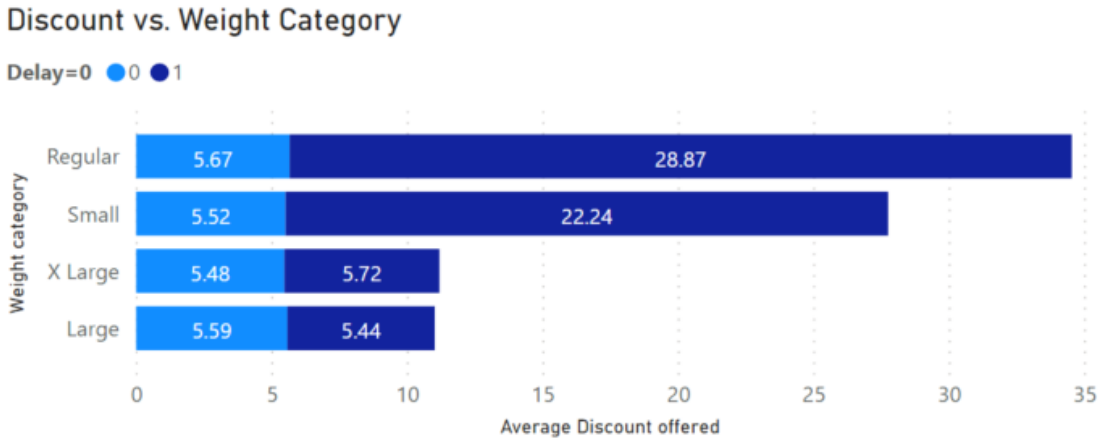
Financial risks of delayed shipments?

- At risk to lose repeat customers who purchased expensive (“high cost”) shipments
- Small but expensive shipments are impacted as well as all heavier shipments of all costs

Discounts have an unexpected relationship to delayed shipments. Depending on the time the discount is offered, there is an opportunity to offer a discount on shipments with a higher likelihood for delay. Note, most discounts are 2-3% but Regular shipments (likely to be on-time) have a median discount over 12%.

Discount Offered vs. Weight Category

Weight Category	Average Discount	Min Discount	Max Discount
Small	$16.86	$1	$65
Regular	$25.51	$1	$65
Large	$5.53	$1	$10
Extra Large	$5.58	$1	$48

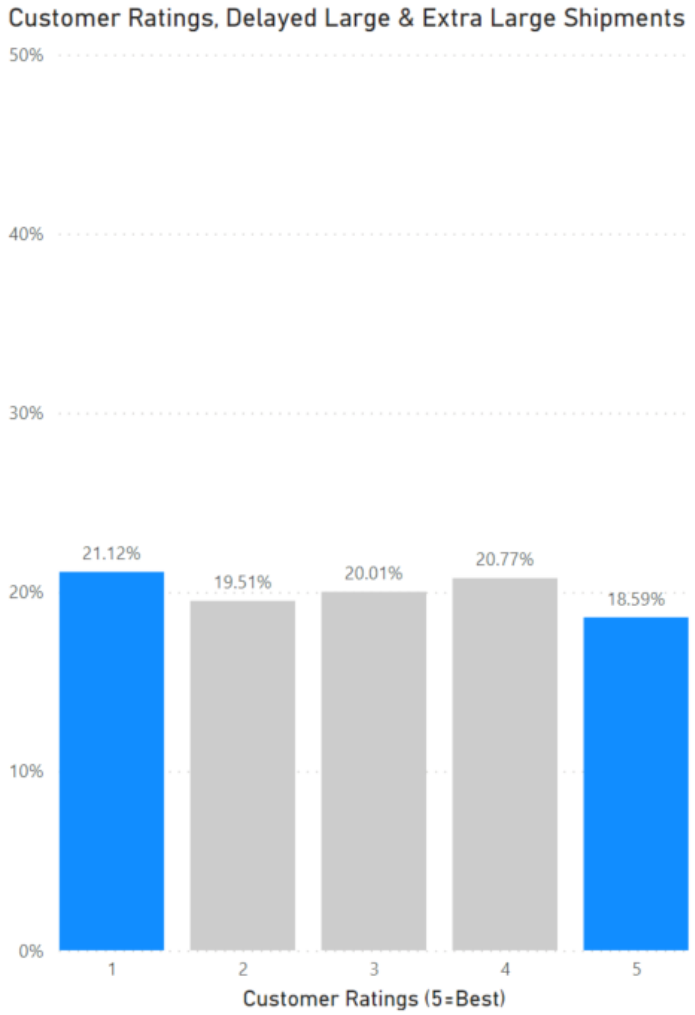


Timing of Discounts?

- If discounts are given at time of purchase, consider managing customer expectations for shipment delays by giving discount to large and extra-large packages and decrease discount on regular and small shipments

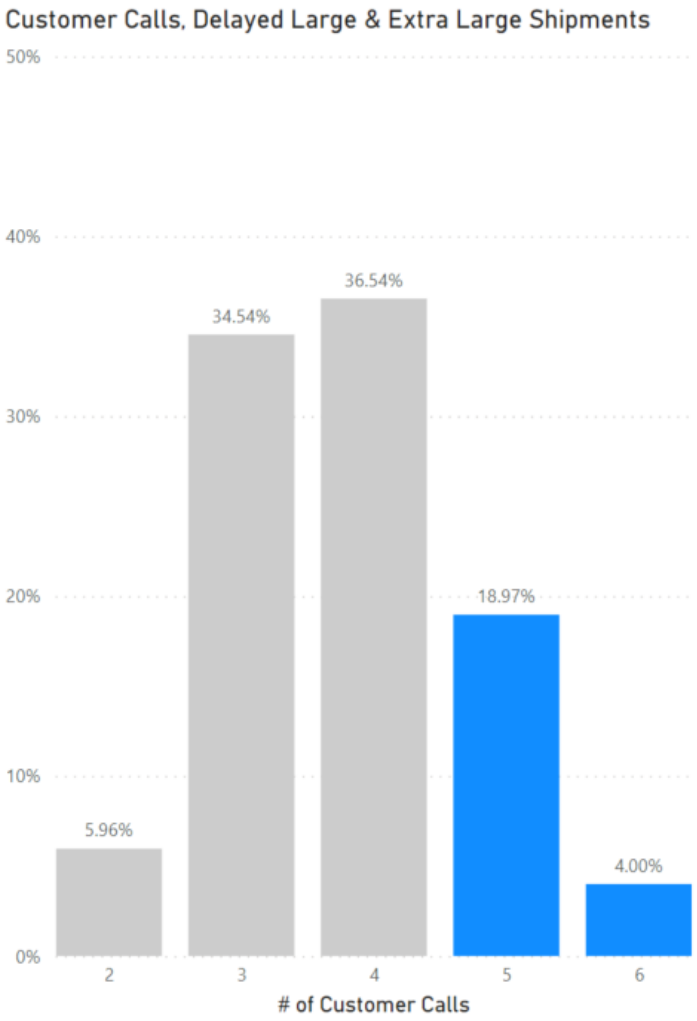
- Discount applied based on customer complaints during shipping process? Likely that small and regular shipments will arrive on time. Shift discounts to at risk shipments.

Customer service implications: decreasing delay rates of heavier shipments will likely improve customer satisfaction and review scores and decrease the number of customer calls. The most common ratings for large and extra-large shipments is a “1” and over 20% of delayed heavy shipments incur 5 or 6 customer calls



Develop strategies to manage the risk associated with delayed shipments:

- Manage expectations
- Keep customers informed
- Increase visibility into shipping process



In summary, heavy shipments are a concern for the company. Higher-cost small shipments are also at risk. Investigate the cause of the delayed shipments, develop strategies to mitigate the risk of delays and to manage customer expectations

Factors leading to delay rates

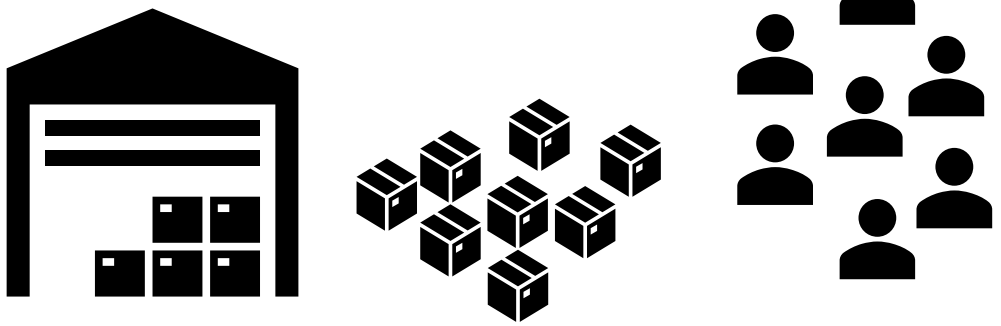
Investigate the cause of the shipment delays of heavier items and improve operational efficiencies and monitoring

- What phase of the shipment (beginning, during shipment, during delivery)
- Evaluate or introduce tools to track the shipments to understand where the delays occur in the process
- Develop strategy for higher cost items (small and heavy are both likely for delay)
- Evaluate multiple carriers or a reliable carrier that specializes in heavier items

Mitigate business risks associated with delayed shipments

Consider communication and/or discount strategy that manages customer expectations

- Depending on when the discount is offered (at time of purchase vs. during shipment)
- Increasing visibility to decrease customer calls / improve review scores / increase customer loyalty



E-Commerce Shipping Data | Kaggle

Logistics & Shipping Trends To Watch in 2021 | Easyship Blog

On-Time Delivery (OTD) KPI Your Most Important Metric In Operations - Xcelpros