Using Data Analytics to Solve Business Problems

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Data Visualization

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Data Analytics offers businesses a base off which important business decisions can be made. It uses available big data to the business and manipulates it to make inferences about performance which can be used to improve processes and functioning. Customer satisfaction is key to a business's performance and survival and therefore analyzing data to determine customer satisfaction is something all business do. In this project, we use an international e-commerce company's data to obtain insights from their customers. The company sells electronic products online and ships them to its customers internationally. Since this company is an e-commerce company, we analyze the company's customer interaction data and shipping statistics to determine customer satisfaction and obtain information about key focus areas. One of the company's major KPIs includes increasing customer satisfaction by make the shipping process efficient. The key metrics for this is achieving that at least 80% of shipments arrive on time.

Background

The ecommerce industry has been evolving and growing rapidly in the past decade and exponentially in the last two years because of the COVID-19 pandemic. According to a study by Clutch (Delgado, 2018) 64% of small business had a website by 2018. 71% of SMB leaders say their customers expected online transactions. (Dougall, 2022) Global ecommerce sales are set to more than double pre-pandemic levels by 2025 (M. Brophy. (2022).

As we witness a rise in online purchasing, the methods of determining customer satisfaction must also change and customer interaction is all hands-off. Now more than ever business must find ways of assessing processes for their online marketplace. A reliable way a business can do this is to look at customer satisfaction data in analysis with shipping data. The objective of this study is to provide a basis of customer satisfaction and allow the business to have a general idea of improvement. Through this study, we will also give suggestions for improvement using visualized data. A dashboard will give the business a snapshot of the company's current standing and help create a base for future predictions.

Methods

Preprocessing

This study looked at 11k customers of an e-commerce company selling electronic goods. The objective is to provide a general overview of customer satisfaction based on which actions for improvement can be taken. Each customer's satisfaction rate is recorded on a scale of 1 to 5. Using this as a base, an attempt to determine factors of influence will be made. Each factor will be analyzed and assessed to determine viability and if metric is viable, further suggestions will be made.

As a part of pre-processing, feature selection and feature extraction were done. For feature selection, it was determined that warehouse block and gender of the customer was not required. Therefore, we eliminated it. The data was imported into the Jupiter platform and null values were then removed using pandas in python. The number of customer care calls and

customer ratings were switched to categorical data and the discount offered was put into bins of size 10. The maximum and minimum for all variables was determined to ensure a reference point is available for all data values. This preprocessing helped understand the data better ready it for manipulation with Tableau.

Data Dictionary

Customer rating was used to determine the customer satisfaction rate. Customer rating is on the scale of 1 to 5, 1 being least satisfactory and 5 being most satisfactory. The customer calls were the number of times the customer called regarding their purchase or status of shipping. The discount offered variable is a percentage of discount offered off the cost of the product. Customer satisfaction was determined based on: on time deliveries, discount given, number of calls to customer care and importance of product.

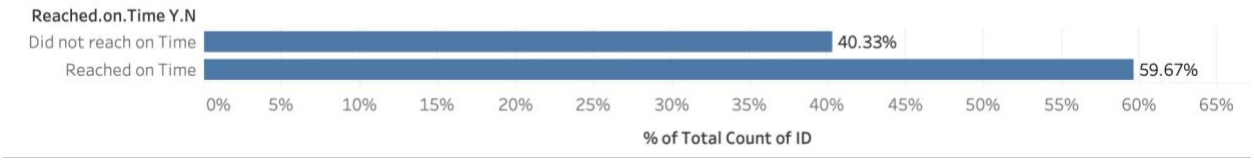
Attributes of Method

This data was obtained through the company using the CRM already available to them. This makes obtaining the data low cost. It uses the most up to date data retrieved from the system with quantity in mind. A larger data set, 11k customer database, allows for increased accuracy of the analysis.

Data Visualization using Tableau

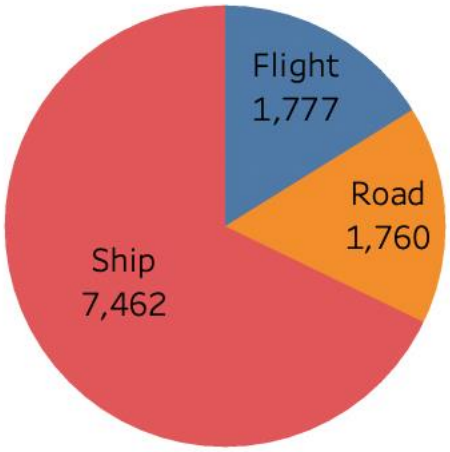
The data was plotted for visual representation to allow for better understanding of company data and make inferences about focus areas. This allows the viewers to see an aesthetically pleasing dashboard while being able to view all information interactively on one screen.

Percentage of Shipments that Reached on Time



As shown by the graph above, about 40% of the shipments did not reach on time. This is not a favorable number as it undershoots the company's target by 20%. An in-depth analysis to why shipments are not arriving on time must be done which is not in the scope of this study.

Shipping Method Used

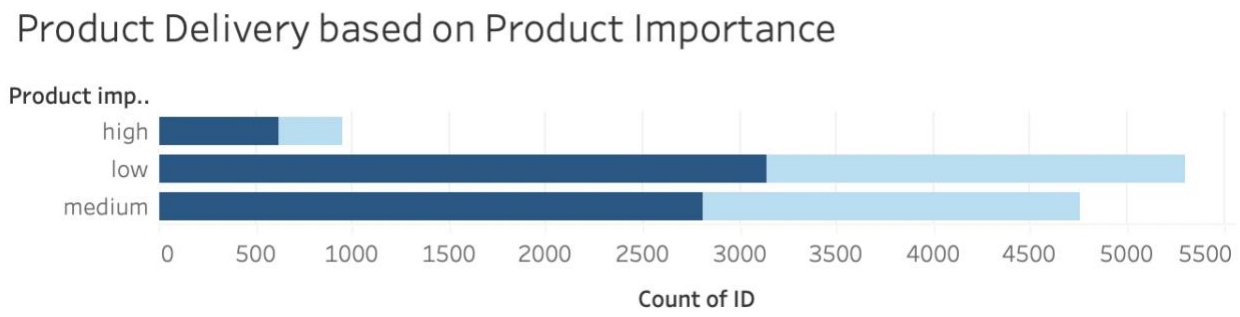


Using the bar graph, we can see that most of the shipments are done using ships followed by flights and then road.

Customer Rating based on Discount Offered

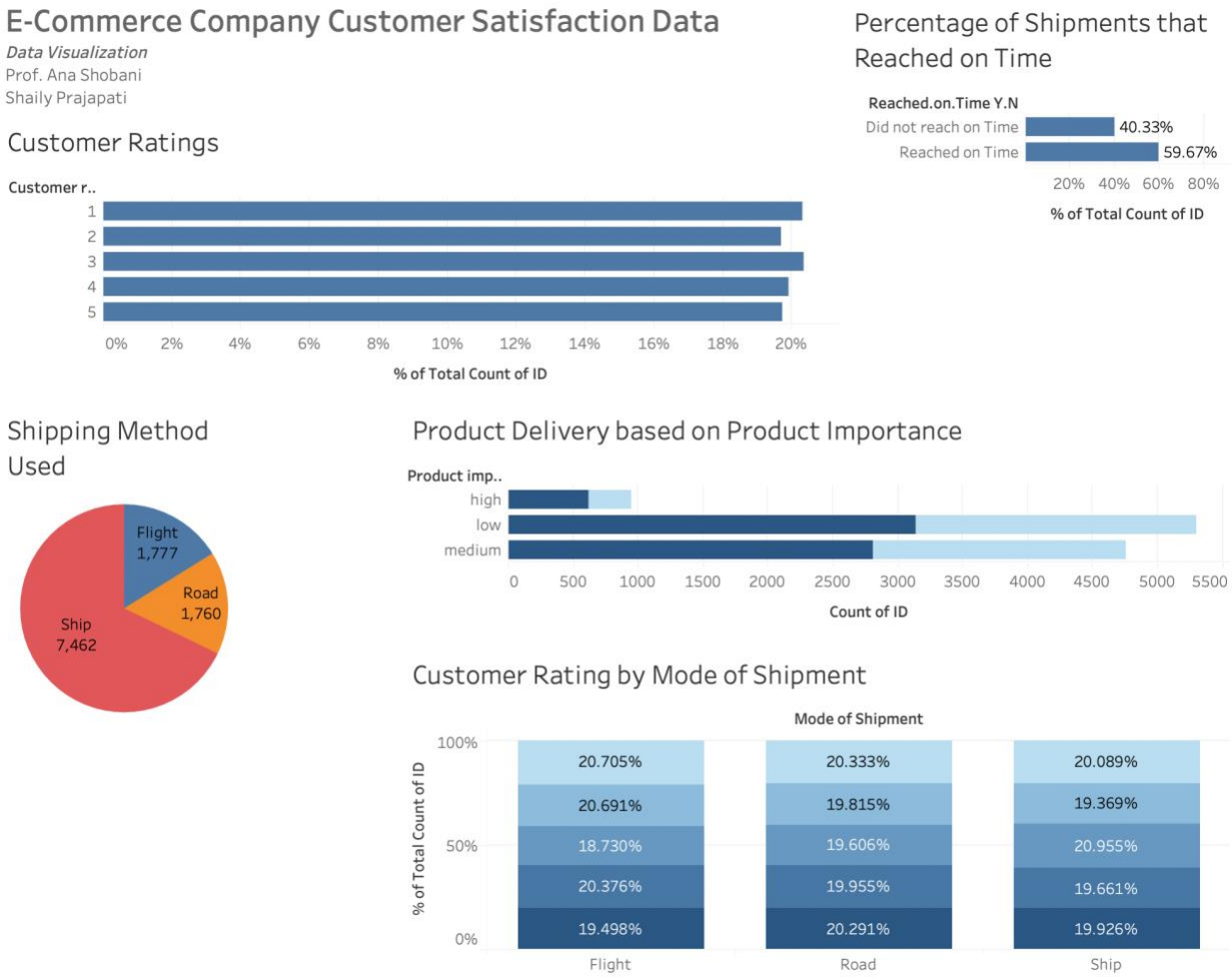
We can see in the above bar graph, the customer rating based on the discount given. It is determined that the highest category we see is that 23% of customers who were offered about

60% discount gave a rating of 1. This helps us understand that offering customers discount is not proportional to customer ratings.



Based on the graph above, we can see that out of the products categorized as high importance have been delivered on time more than 50% of times. Additionally, the same can be said for low and medium importance products. This is also not a favorable metric to see as the percentage of on time delivery for high is the same as low and medium. A preference should be given to high importance products.

Dashboard View



Analysis Outcomes

The customer ratings are equally distributed among the data. About the same number of customers have given a customer satisfaction rating of 1,2,3,4, and 5. Based on the data, we can inference that the business needs to focus more on shipments and not on giving discounts as giving discounts does not result into better customer satisfaction. Perhaps the funds used to offer discounts can be reallocated to obtain better shipment method and types that result in on time product deliveries.

This method of data analytics allows a business to determine what the systems work for the business and which area it needs to focus on to achieve its KPIs. We can clearly see that the set KPI of having 80% of shipments reach on time to customers is not being met. Although, through this analysis we have determined a base on which we understand where the business stands, and improvement can be made from here on.

Tableau Dashboard Link:

https://public.tableau.com/views/TableauFinalreport/Dashboard1?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

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