

**Story Telling and Communication with Data  
Report:  
Way Fair Case Study,**

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## Contents

EDA Visualization: .....	2
Visualization Link: .....	<b>Error! Bookmark not defined.</b>
Business Question 1: .....	4
Visualization B1: .....	4
Utilization of Bar Chart: .....	4
A New Marketing Strategy: .....	4
Platform Wise Distribution of Revenue: .....	5
Outdoor Category .....	5
Business Question 2: .....	6
Visualization Link .....	6
Campaign Purpose and Measurement of Success .....	6
Data Visualization: Comparing Campaign Results .....	6
Expected Outcome vs. Actual Results.....	6
Recommendations for Future Campaigns: .....	7
Final Conclusion:.....	7

EDA Visualization:

## Visualization Link

The first step we took in working with Tableau was to thoroughly understand the dataset at hand. Groups were created by selecting multiple items (e.g., categories or dimensions) and combining them into a single group for simplified analysis. This can be done by right-clicking the selected items and choosing "Group." Calculated fields are custom formulas you create to derive new data based on existing fields. To create one, you click "Analysis" in the menu, then select "Create Calculated Field" and define your formula. These tools help in organizing data efficiently and gaining deeper insights. We focused on analyzing user behavior, investigating aspects such as how different types of users purchase products, which products are bought individually or together, and patterns of repeated purchases. In addition, we examined the dataset for any unusual values, determined if certain columns needed modification or combination, and explored the possibility of recasting numeric variables as categorical or vice versa to extract more meaningful insights.

An important realization was that the total quantity of products sold was not merely the number of items purchased. To get an accurate figure, we needed to subtract both returned and canceled quantities from the purchased amount. Since the canceled quantity was categorical data, we created a calculated field to properly measure the total quantity of products sold.

Given the wide range of products available at Wayfair, we also recognized the need to group them logically. To address this, we manually created product categories such as bedroom furniture, electric appliances, kitchen furniture, living room furniture, office supplies, outdoor and storage items, and a miscellaneous "others" category.

Here is how the grouping was done:

- ☐ Bedroom Furniture: Includes bedding, bedroom furniture, mattresses, and upholstery.
- ☐ Electric Appliances: Comprises appliances, AV equipment, heating grills, lighting, and small electrics.
- ☐ Kitchen Furniture: Contains kitchen furniture, kitchen essentials, and tabletops.
- ☐ Living Room Furniture: Includes accent furniture, entertainment furniture, and rugs.
- ☐ Office Supplies: Covers office furniture and office supplies.
- ☐ Outdoor and Storage: Includes outdoor decor, structures, storage, and equipment.
- ☐ Others: Encompasses decorative accents, education, flooring, hardware, health and fitness items, luggage, pet supplies, plumbing, seasonal decor, and more.

The formula we used for calculated fields are :  $[\text{Purchased Qty}] - [\text{Returned Qty}] - ([\text{Cancelled}] * [\text{Purchased Qty}])$  since cancelled quantity is in 1/0 but the 1 here means that it is cancelled and 0 means it isn't cancelled. but the purchased quantity can be 10 or 2 or 3.

Each of these categories had varying quantities of orders, cancellations, and returns. To further analyze product performance, we considered how different types of visitors—such as acquired members, activated customers, new visitors, and returning visitors—affected the number of orders placed. To facilitate this analysis, we created a parameter that allowed for a deeper understanding of how these different visitor types impacted order quantities.

We further added to our analysis by addressing two relevant business questions as described below.

## Business Question 1:

Did Group B (who saw the "Ships in Time" guarantee) spend more per order than Group A?

We would answer this question through two visualizations.

### Visualization B1

We would be primarily using our **visualization** to see the per order impact on Net Revenue to average calculation to gain some insight. We are trying to see how does our Net Revenue which we calculated by the following formula  $\{ \text{FIXED}[\text{Order Product ID}]: \text{SUM}([\text{NetPurchasedquantity}] * \text{SUM}([\text{ProductPrice}])) \}$ , Where NetPurchasedquantity as explained previously was calculated using  $\{ \text{FIXED}[\text{Order Product ID}]: \text{SUM}([\text{Purchased Qty}]) - \text{SUM}([\text{Returned Qty}]) - \text{SUM}([\text{Cancelled}] * \text{SUM}([\text{Purchased Qty}])) \}$ , relates to product categories and revenue on different platforms as percentage of total revenue.

### Utilization of Bar Chart:

We are using a bar chart to draw the relationship between product categories and Net Revenue. **As we observe the results, we can clearly see that the overall revenue was much higher in Group A than compared to Group B.** Various reasons can be mentioned to explain this phenomenon. However, that is not the case with average revenue as can be shown in making some adjustments in the measure feature. We can see that Average revenue per member in Group B is higher than Group A thus it indicates that customers on average are willing to buy perhaps more products on Christmas when they are given a guarantee option.

### A New Marketing Strategy:

Since this is a new marketing strategy and customers are not accustomed to using the guarantee feature hence majority choose not to avail themselves of the offer for delivery at Christmas. A growth trend can be expected in the next few years, since already there are a significant number of customers who did avail

themselves of the guarantee offer and manage to capture a significant revenue. The revenue from Group B comprises 30 to 40 percent of revenue across various categories whereas the revenue from Group A comprise 60 to 70 percent of revenue.

### Platform Wise Distribution of Revenue:

Living Room furniture sales ordered on the desktop platform by customers resulted in the highest amount of revenue for Group B, whereas Group A had the highest percentage of revenue of sale of Office supplies on the desktop platform. Since Christmas is usually conducted at home, and offices are usually closed on holiday, we can expect a lower demand for office-related furniture items on Christmas. The demand for living room furniture often increases during Christmas due to the holiday season's focus on social gatherings and home hosting. Families and friends come together for celebrations, prompting homeowners to upgrade or refresh their living spaces to accommodate guests. Living rooms, being central to holiday activities, become the focus of attention, leading to purchases of new sofas, chairs, or coffee tables to create a welcoming environment. Additionally, the holiday tradition of decorating homes with Christmas trees and festive items further encourages people to invest in furniture that complements their holiday decor, enhancing the overall aesthetic for their gatherings.

We can also clearly observe that both platforms including desktop and mobile web had not much variation in the bringing of sales, as revenue percentage across them was almost the same. This gives an interesting insight into the importance of both platforms. Visually appealing graphics observed in detail on Desktop and being open to careful scrutinization, would be a go-to-do method for many customers and buyers and shoppers online. A mobile purchase may follow a desktop research follow up and sometimes key details about some products might be significant enough to encourage mobile users to save time and effort going for detailed research on desktop and buy immediately on mobile. The growth of mobile marketing in the present era can also be considered for future growth. Thus, both platforms can be considered credible to drive sales both with guarantee offers and without guarantee offers.

### Outdoor Category

Another category which brought higher number of revenues in Group no B was the Outdoor and Storage category. Percentage of revenue sales almost equaled to that of Living room furniture. Since Outdoor and Storage capacity furniture might be in high demand during Christmas as seating and accommodation is crucial during Christmas, this can explain the greater percentage of revenue for Outdoor Furniture. During the holidays, there might be a significant demand for outdoor furniture, especially in areas with warmer climates where people enjoy Christmas and New Year's Eve outside. The great weather during the holiday season stimulates outdoor gatherings, barbecues, and celebrations in areas like tropical regions, Australia, and the southern parts of the United States. When gatherings of friends and family occur, homeowners furnish their outside areas with cosy seating arrangements and dining areas by investing in outdoor furniture. To make outdoor entertaining areas cosier and more useful, this involves investing in patio chairs, outdoor dining sets, and lounge furniture.

Thus, it can be said that although Group A revenue was significantly higher but Group Bs contribution in average revenue per order ID was higher than Group A thus highlighting the significant potential of the guarantee option to bring sales and growth in the industry.

We can gain further insights from our business question 2.

## Business Question 2:

Did the campaign successfully increase the amount of customers shopping ‘last-minute’?

### Visualization Link

#### Campaign Purpose and Measurement of Success

Perhaps the most important aspect of a campaign is its purpose: What did Wayfair aim to achieve? Answering this question also helps determine how we’ll measure the campaign’s success.

Since Wayfair used the appeal of their delivery capabilities to boost sales, the success of the campaign must be measured by examining how well those delivery promises were fulfilled—especially around the promised delivery dates.

#### Data Visualization: Comparing Campaign Results

The visualization shows a line chart with two lines: the blue line represents customers who were shown the delivery guarantee, while the orange line represents those who were not. The dotted lines that intersect each of these solid lines are trend lines, highlighting the overall linear direction of revenue in the days leading up to Christmas.

For the sake of this analysis, we are using data from December 12<sup>th</sup> to December 19<sup>th</sup>. We can consider that browsing for gifts after December 17<sup>th</sup> is considered last-minute shopping.

It’s important to note that the selected dates represent when customers first started browsing for their eventual purchase. We chose these dates because they indicate the first interaction customers had with Wayfair as a result of the campaign.

#### Expected Outcome vs. Actual Results

If the campaign had been successful, we would expect to see an upward trend—especially compared to the control group—showing an increase in revenue as the holidays approached, signaling more last-minute shoppers. The idea is that the delivery guarantee would make customers feel more comfortable shopping closer to the holidays, knowing their gifts would arrive on time.

However, our data shows the opposite. The group that saw the delivery guarantee appeared *less* comfortable shopping for last-minute presents compared to the control group. In fact, the trend lines suggest that for every type of customer (activated, acquired member, new, returning), browsing for gifts increased as the holidays approached for the control group but decreased for those shown the guarantee.

This suggests that the campaign may not have achieved its intended goal: providing customers with a sense of comfort for last-minute gift shopping. But the campaign could have possibly increased company revenue nonetheless.

There are several possible reasons for this outcome. For instance, the psychological comfort of knowing delivery is guaranteed might lead customers to spread out their purchases over time, rather than concentrating them close to the holiday rush, thus reducing last-minute sales – causing the opposite of the desired effect as seen in the data, but possibly increasing revenue.

Additionally, perceived assurance of timely delivery may have decreased the sense of urgency to shop at the last minute.

### Recommendations for Future Campaigns:

If Wayfair's goal is to increase last-minute sales, they could consider offering discounts on inventory predicted to underperform, rather than making an expensive delivery promise that could potentially ruin a family's holiday experience.

### Conclusion:

The current campaign has not been successful in driving last-minute sales, highlighting the need for a more effective marketing strategy that consistently reminds consumers about their purchases. By doing so, customers will be more inclined to make purchases earlier. Notably, Group B customers contributed a higher percentage of revenue compared to Group A, and this revenue represents a significant portion of the total. Therefore, if the campaign is executed properly, it has the potential to succeed and significantly boost the company's overall sales.