Analysis Attack Plan

Nike By You Case Study

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Prompt

This analysis plan is in response to a prompt given to me by another data science lab during their interview process to test/illuminate how I would go about analyzing a theoretical client's problem with underperforming sales. The prompt assumed Nike as a client was having issues with their custom clothing line, Nike by You.

Following is an outline of my approach to data analysis in a sales context.

Approach to Data Analysis:

1. Identify Experts
2. Diagnose Failed Forecasts
3. Clean and Explore the Data
4. Form Hypotheses
5. Validate and Iterate
6. Present Data Visually
7. Recommend Solutions

Identify Experts of the Problem:

- Consult with internal experts at company
- Has a similar problem been seen before? (For example, prior work with miadidas)
- This may result in a more efficient approach, reducing time and resources spent on the problem

Failed Forecasts: Two Possible Scenarios

1. The original forecast was incorrect because of top-down forecasting.
    a. Who are the stakeholders?
    b. How did they arrive at their targets?
    c. Is the current deviation of sales and forecast an anomaly?

2. The original forecast was bottom-up but did not consider vital variables.
    a. What assumptions were made about previous data (data biases)?
    b. What assumptions were made about the product?

Step 1: Cleaning and Exploring the Data

First I would clean the pertinent data, then do preliminary analysis on sales datasets.

1. Descriptive Statistics: Mean, median, mode, range, quartiles, absolute deviation, variance, standard deviation, and probability distribution.

2. Identify and separate periodicity, trend, and random variation.

3. Represent the data graphically: histograms, scatter plots, box plots, etc.

Step 2: Forming Hypotheses

- Multiple hypotheses need to be explored.
- Since forming the wrong one can be costly, good research is important for this step.
- The problem could be caused by many factors, so multiple hypotheses may prove correct.

Possible Hypotheses for Consideration:

- Product fit - Do people actually want this product?
- Marketing fit - Are the right people seeing ads?
- Costing - Is the product priced appropriately?
- Website design - Is the customer experience too complicated?
- Factory issues - Are there quality Issues? (Sentiment analysis of reviews)
- Competitor products - Why did Miadidas discontinue?
- Other unknown factors - Dimension reduction with product metadata

I will be exploring two potential hypotheses in depth.

Hypothesis 1:

Hypothesis 1: The original forecast for the Nike By You product line was too aggressive.

Basis of Hypothesis: This hypothesis makes the assumption that it is supported by external market data. In this hypothetical scenario, there is indication that sales for similar products were also down in the prior two fiscal months. This approach would be considered early if the original forecasts used a top-down approach.

Hypothesis 1:

Data to be looked at:

1. Customer information (to associate data)
2. Website clicks
3. Sales history
4. Market history

Tools and methods for validation:

1. Moving average analysis (Where have the products and market been headed?)
2. Regression analysis (To what extent do market conditions correlate with the sales?)
3. Fourier analysis (Does periodicity appear?)

Hypothesis 2:

Hypothesis 2: The abundance of options in the Nike By You product line creates an “analysis paralysis” response from consumers, leading to the recent drop in sales.

Basis of Hypothesis: According to the report, When Choice is Demotivating: Can One Desire Too Much of a Good Thing?, published in the Journal of Personality and Social Psychology, too much choice for a consumer may actually lead to a decrease in sales turnover by a factor of ten.

Hypothesis 2:

Data to be looked at:

1. Customer information (to associate data)
2. Percentage of Nike By You website visits resulting in sales
3. Nike By You web application usage data (time spent, number of revisions, etc.)
4. Sales history

Tools and methods for validation:

1. Regression analysis (How much does time spent in app correlate with sales turnover?)
2. Clustering (Can we create customer clusters based on purchasing/app behavior data?)

Step 3: Perform Further Validation

- Revise the forecasting model with validated hypotheses
- Iterate: Examine the results and loop back with further analysis
- Consult the experts again
- How well do the new models seem to explain the problem?

Step 4: Present The Data Visually

- Conclusions need to be translated into presentable formats for Nike senior executives
- Visualizations: Charts, tables, graphs
- Analogies for complicated information

Step 5: Provide Recommendations

My recommendations would normally depend on all of the tested hypotheses, however, in this exercise I will focus on just the two I explored independently.

If hypothesis 1 is correct I propose:

1. Reworking the Nike By You product portfolio
2. Incorporating new features to the product line not yet available on the market

If hypothesis 2 is correct I propose:

1. Streamlining the web application
2. Reducing the number choices
3. Using machine learned choice recommendations, (like those Spotify and Netflix use)

Conclusion:

In this case study, I have diagnosed the recent divergence, tested and validated hypotheses, and presented actionable recommendations for Nike senior executives.

Results:

- Nike leadership will be more informed about how to effectively improve the Nike By You business
- Your company will be advantageously positioned as a trusted and high value partner