Girl Scout Cookie Analysis

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Content

Executive Summary

Based on our research, our team has identified internal and external key factors influencing cookie demand, such as troop location, economy, taste, marketing etc.

We developed a Regression model based on historical data on the mentioned factors to forecast cookie sales for GSNETX in 2023. We estimated that 2.64 million boxes of cookies would be produced.

Finally, we have provided recommendations to optimize girl scout cookie sales from the four perspectives of children, parents, GSNETX, and GSUSA.
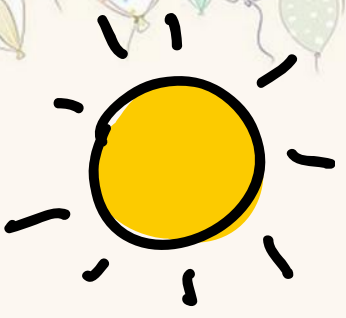
Key Factors Affecting Demand-[Internal]

1 **Price**: Cookie sales at GSUSA fell almost 9.2% in 2020 compared to 2019.

2 **Location**: The main reasons are that the top three locations every year have a higher number of girl scouts and an optimal team size and higher per avg cookies sold.

3 **Age-Wise Workforce**: Adults tend to trust the process more and buy in more because of the behavioral effect of younger children.

4 **Flavour**: With Thin Mints being the most popular, Toffeetastic is the least-selling flavor of every year.

5 **Troop Management**: The average number of girls per troop was roughly 9 in both 2019 and 2020, however, this reduced to 5 in 2021 owing to the negative effect of COVID-19. Fortunately, this figure has returned to 2022. An optimum of 7 to 8 girls per troop proves to be the best fit for driving maximum sales.
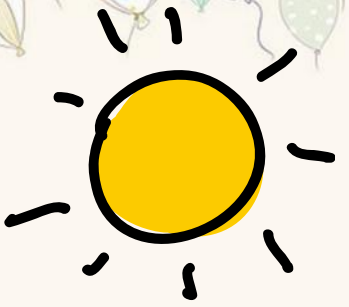
6 **Incentives**: Rewards are positive reinforcement for children that helps children to see the values behind their actions.

7 **Marketing**: The amount of FB Marketing impressions has increased by 10% year on year, with current figures total of 200 million impressions.

Key Factors Affecting Demand-[External]

1 **Weather Condition-Mean highest temperature:** The google analytics report on the recorded temperature in northeast Texas shows the volatility and results in significant demand uncertainty.

2 **Economy:** For the selling seasons, an average of unemployment rates in those months of northeast Texas is taken into consideration.

3 **Competitors:** Boy Scouts have begun to accept female members. These had a detrimental influence on the number of Girl Scout members. A relative study of market share is an important variable to estimate cookie sales.

4 **Shipping Costs:** Handling charges in the shipping industry have increased by 2.7% year on year. This applies to packages weighing between 2 and 5 pounds. A shipping order typically contains 7.5 boxes of cookies and weighs roughly 3 lbs (6.17 ounces for each box)
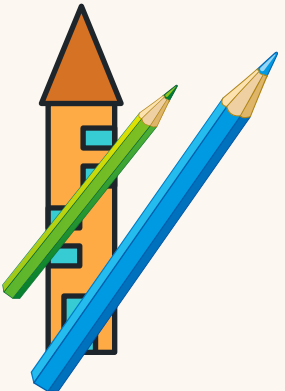
Building the Model

STEP 1: Hypothesis Building around internal and external factors

STEP 2: Import external data

STEP 3: Testing Correlation and Significance

STEP 4: Employ Pivot tables in Excel to build data sets for Y Variables: Digital Delivered, Digital Shipped, Digital Donated, Physical Donated, (FFR+Booth), Overall

STEP 5: Check for outliers

STEP 6: X Variable weighted average forecasting

STEP 7: Multivariable Linear Regression Model for Y Variable Forecasting with backward elimination

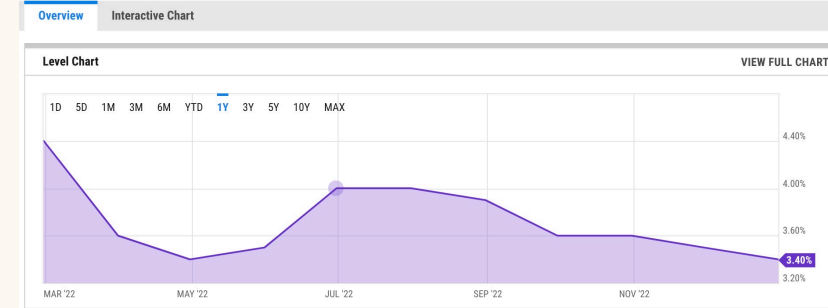**STEP 8:** Bringing the forecasts together and drawing insights

External Data Resources

Temperature resource: world-weather.info
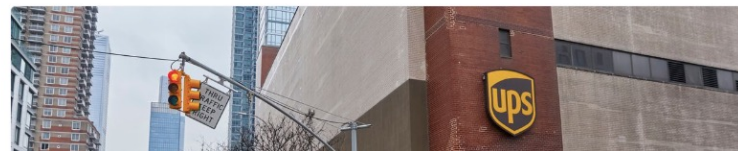

Employment report: y-charts

UPS mirrors FedEx with 6.9% rate hike

The increase for the logistics giant's Ground, Air and International services will take effect Dec. 27.

Published Oct. 25, 2022

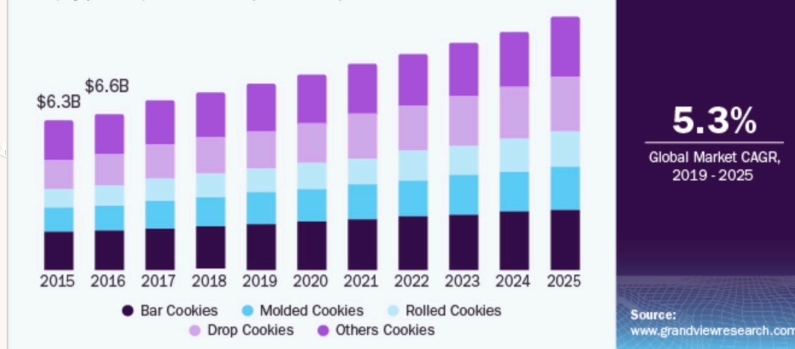Max Garland
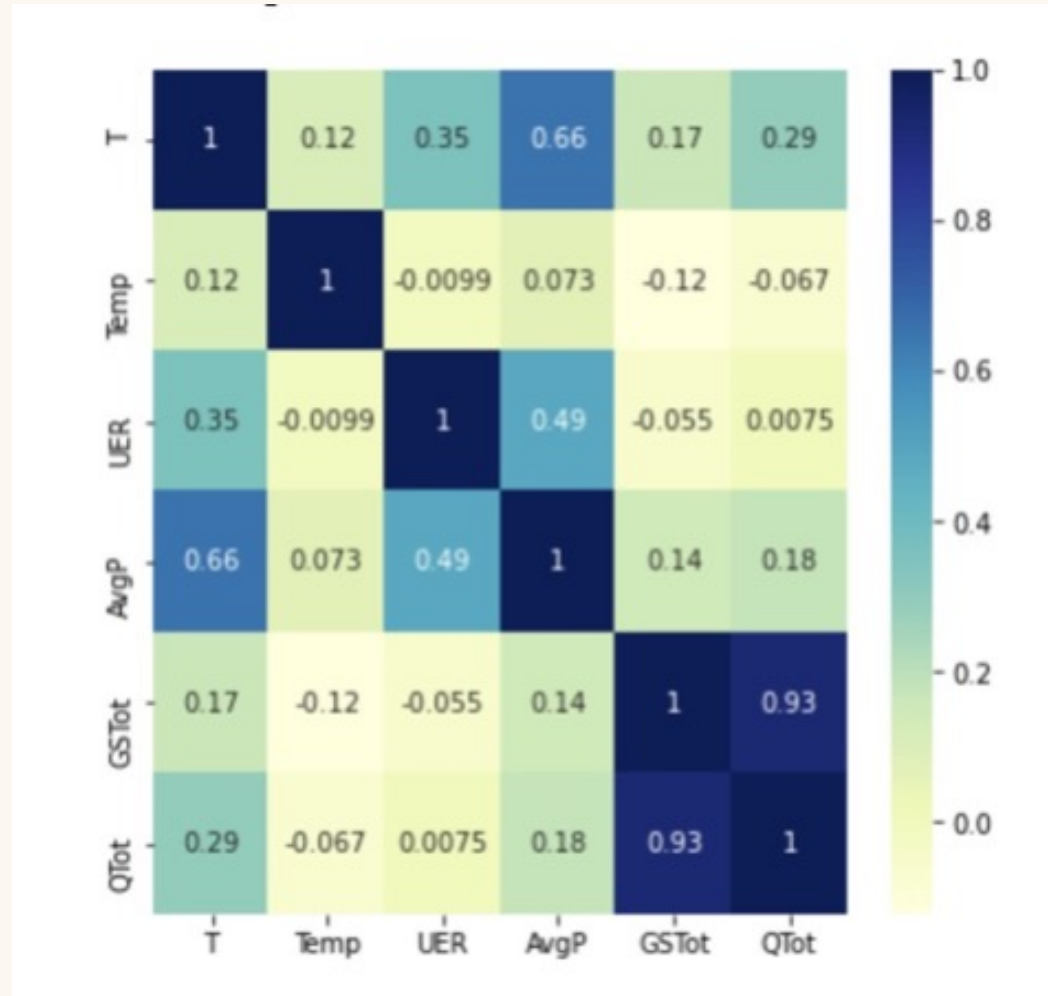Senior Reporter

Shipping Costs resource: Retail Dive

Market report: grandviewresearch.com

Sample Correlation Matrix- Digi Del.

Temperature and Average unemployment rate have little or no effect on the quantity sold of cookies.

Forecasted Plan For 2023

Distribution Channel	Volume Forecasted (in thousand boxes)
Digital Delivered	891
Digital Shipped	210
Donations (Digital + Physical)	106
Friends, Family & Neighbors	965
Booths (Tom thumb's, Sam's Club etc.)	554
OVERALL	2640

- The auxiliary warehouse needs to be informed of keeping 210 thousand boxes in reserve for digital shipment orders.

- Close to 2.43 Mn boxes should be ordered by GSNETX for this season with a variability of 10% keeping unexpected demand uncertainty in mind.

- Little Brownie Bakers must be prepared to deliver boxes anywhere between the lower limit 2.4 Mn to 2.9 Mn

A Variety View

Distribution Channel	Volume Forecasted (in thousand boxes)
Trefoils	207
Dos-si-dos	200
Samoas	534
Tagalongs	343
Smores	139
Tofee Tastic	68
Lemon Up	217
Adventurefuls	278
Thin Mints	652

- Thin Mints leading the charts with increasing popularity.

- Toffee-tastic witnessing a YOY decline in sales

- The model used for prediction: Holt's Method (optimal solver weights)

Risks & Assumptions

• **Refund Rate**: It has been not used as a part of our analysis and might have compelling trends to be observed in future studies

• **Data clean-up**: During the analysis of Girl Scout data, outliers (extremely low sales on certain days) were excluded from our analysis to provide a more accurate time series forecast.

• Data on GSUSA **shipping cost** was not available on the internet for the last years, so a generic trend report from UPS was taken.

• The **unemployment rate** of Texas is the same as that of northeast Texas.

• Weather data was taken keeping the city of **Tyler** in mind.

Strategies And Incentives

Parents Level: Make parents willing to let their kids join Girl Scout

GSNETX Level: Actions local council can take to improve cookie sales

GSUSA: Actions Girl Scout head quarter can take to make GS better!

Children Level: Stimulate girls to sell more cookies
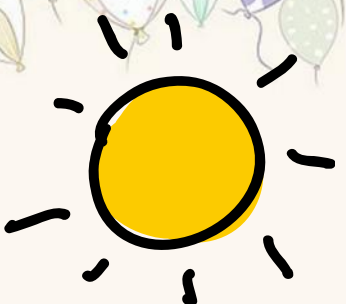
Strategies And Incentives

Children Level:

Direct Incentives

- **Increase the variety of rewards for girls who sold cookies under 600 boxes.** 90% of girls sold cookies less than 600packages
- **Offering rewards that are appealing to all girl scout age range in every reward category.** since the age range of girls is broad

Indirect Incentives

- **Group consciousness can be taught as a motivation to girls**, with emphasis on the extra reward that will be given if the sale of troops exceeds a certain amount.
- **Education of the knowledge and meaning embedded in selling cookies.** Entrepreneurial strategies, communication skills and charity meaning behind the cookie program.
- **Eye-Catching Cookie booth and cookie box DIY session,** encourage girls to use their imagination and creativity to design booth tables and draw on the cookie box.
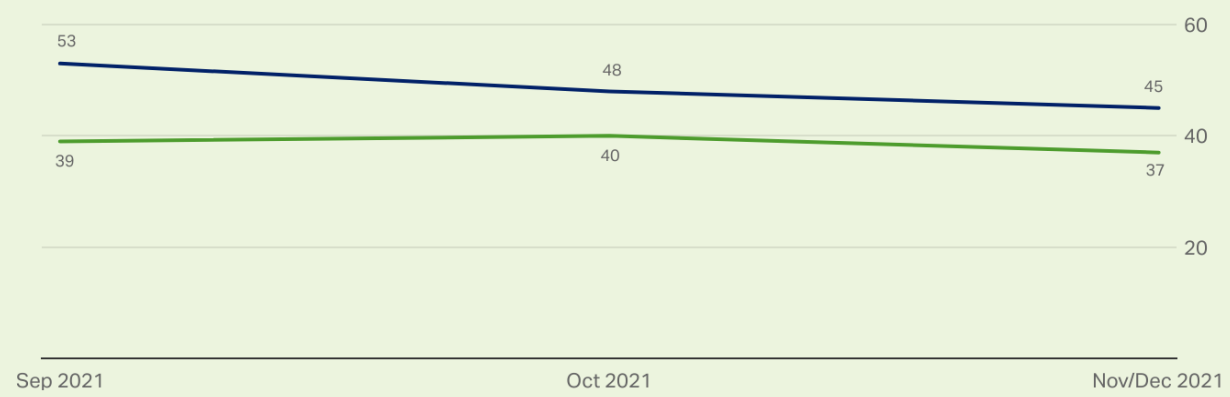
Strategies And Incentives
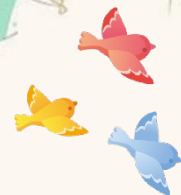
Parents Level:

- **Provide sanitary health pack to children.** Among all parents, 50% worry their child will get sick and 46% are concerned they will become ill.

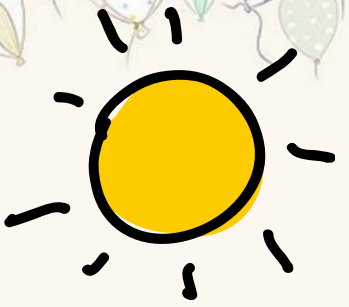**Parents' Worry About Child and Self Getting COVID-19**

% Very/Somewhat worried

— Worried you will get it — Worried child will get it

53	48	45
39	40	37

Sep 2021 — Oct 2021 — Nov/Dec 2021

GALLUP

Strategies And Incentives

GSNETX Level:

- **Google Map 'girl Scout Cookies near me'.** GSNETX can work with APPs that people have been frequently using in their daily life.
- **Cooperate with delivery APPs such as 'Doordash'/'Ubereats.** The cookies sold through digital orders increased from 7.1% in 2019 to 35.6% in 2022.
- **Start to sell cookies in December.** There is more demand for cookies during the holiday season. GSNETX can also distribute gift wrappings.

GSUSA:

- **Expand the race of girls, and cooperate more culturally diverse activities into its program.** The percentage of Latina（12%）and African American scouts（11%）

- **Include more guests from diverse industries** to have a fun introduction presentation, to encourage girls to find their interest in future career paths.

Any Question?

Thank you