

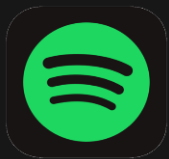
# A DATA-DRIVEN APPROACH TO COST EFFICIENCY:

UNDERSTANDING **SPOTIFY'S** OPERATIONAL COSTS AND THEIR  
IMPACT ON PROFITABILITY

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# Data Description



Source : Kaggle



Dataset: Spotify Revenue, Expenses and Its Premium Users – Quarterly Report (Q4 2016 - Q1 2023)



Observations: 26 rows



Features: 17 columns



Target Variable: Gross Profit

# Business Questions



**Main Question:** How do Spotify's operational costs impact profitability across areas?



**Efficiency Focus:** Is Spotify effectively allocating resources to maximize profitability?



**Improvement Strategies:** What actions can Spotify take to optimize costs and enhance efficiency?



# Features of Interest

- Cost of Revenue
- Operational Costs
- MAUs
- Premium MAUs
- Ad MAUs
- Premium ARPU

**N.B:** All *money figures* are in *Euro millions* except ARPU which is in Euro AND all *users figures* are in *millions*



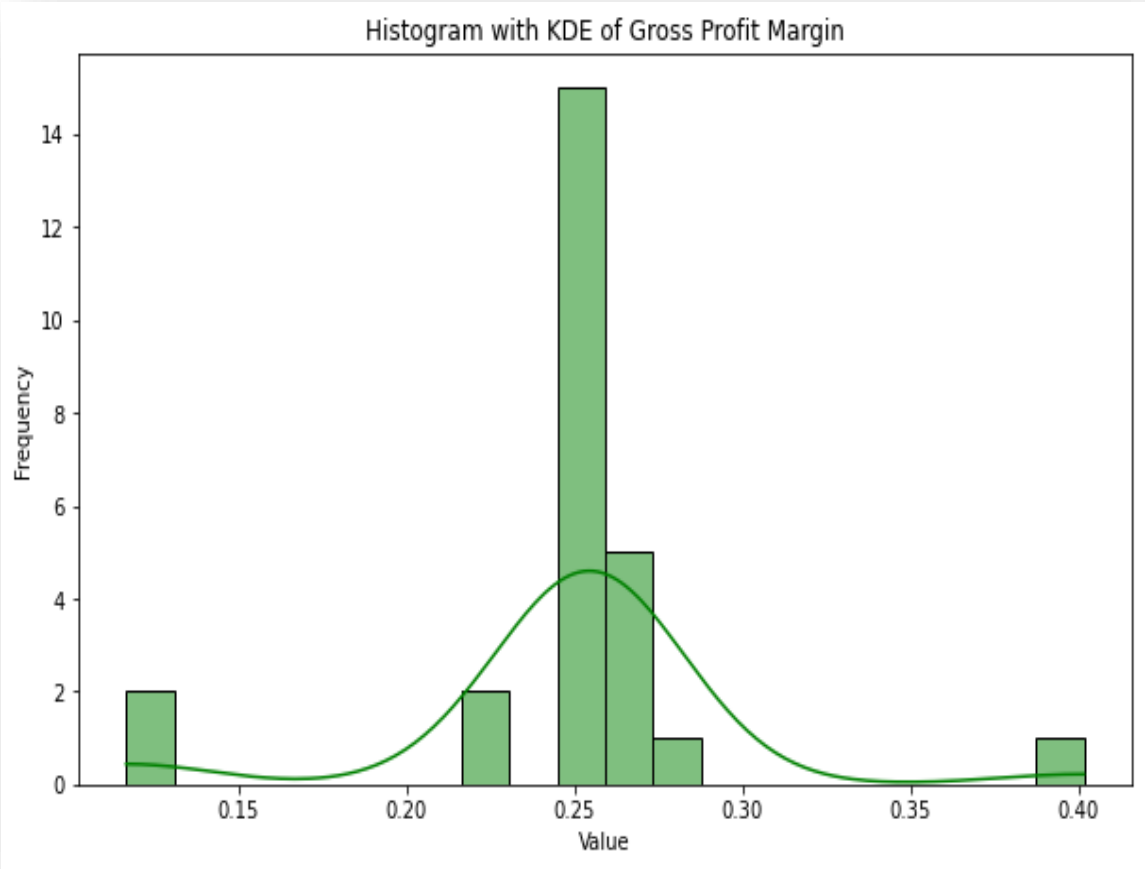
# Data Preparation

- **Data Cleaning:** Fixed nulls and spelling errors.
- **Missing Data:** Found and addressed missing row.
- **Trend Check:** Quarterly data shows consistency.
- **Filling Gaps:** Backfilled missing values, except ARPU.
- **Rationale:** Preserved integrity and trend consistency.
- **Outcome:** Enhanced data reliability and continuity.



# Descriptive Statistics

Descriptive Statistics	Total Revenue	Cost of Revenue	Gross Profit
Mean	1908.92	1423.27	486.04
Standard Dev.	705.22	517.27	200.37
Minimum	902.00	775.00	105.00
Median	1851.50	1378.50	476.50
Maximum	3166.00	2365.00	801.00



# Data Transformation and Variable Creation

- Cost Contribution %
- Cost Variances
- Gross Profit Margin
- Rolling Averages
- Lagged Variables



# Spotify's Operational Cost Contribution

## Sales & Marketing (S&M):

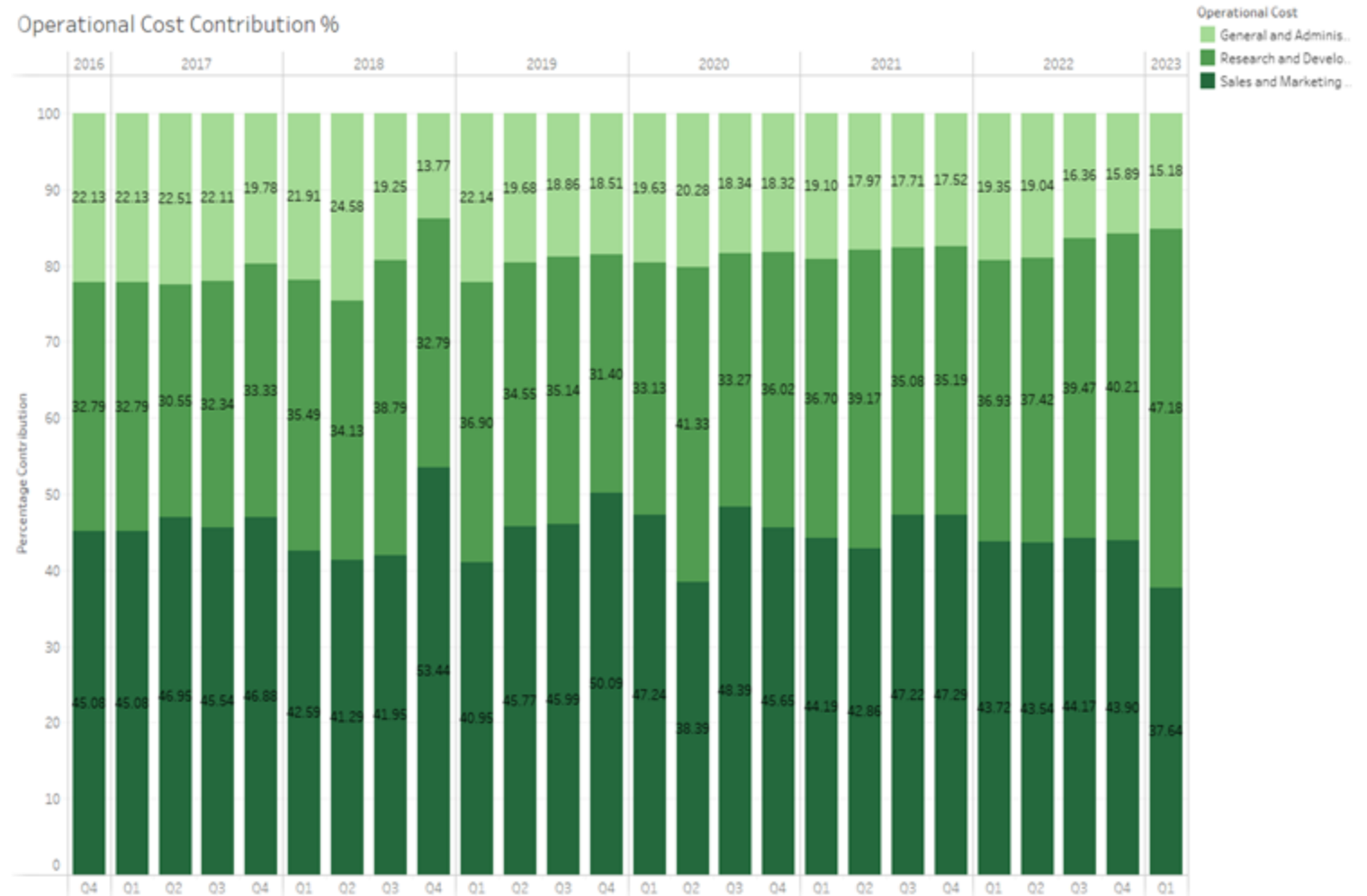
- Consistently the *largest contributor* to operational costs, accounting for over **44.8%** on average

## Research & Development (R&D):

- Contributions are steadily growing, accounting for **35.8%** on average

## General & Administrative (G&A):

- Lowest contributor to costs across all years, accounting for **19.3%** on average over the years





# Gross Profit Margin Trends

## 2016–2017:

- Rapid growth, margins up

## 2018–2019:

- Stabilized margins (~25%)

## 2020:

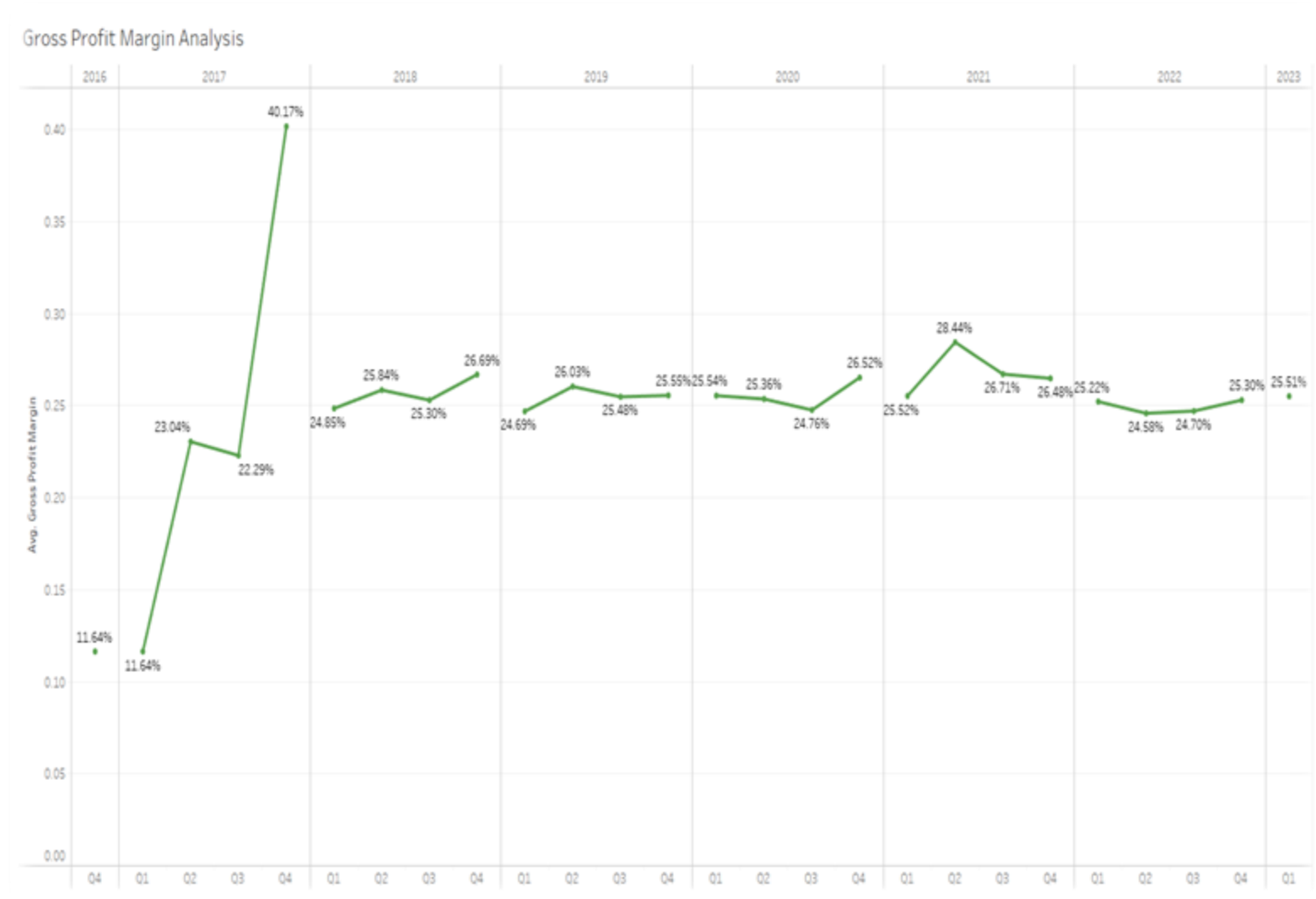
- Slight margin dip (~24%)

## 2021:

- Margins peak briefly (28%)

## 2022:

- Flat margins (~24–25%)



# Model Overview

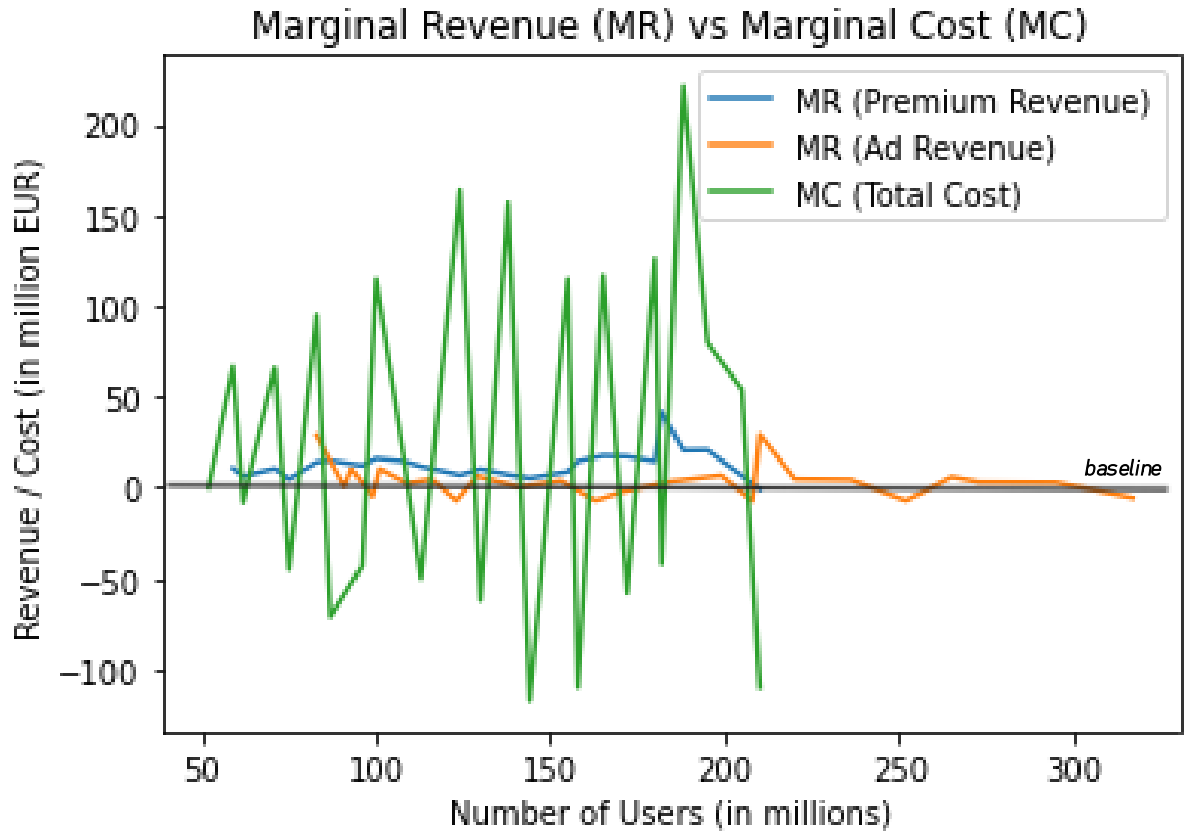


# Feature Importance



SPOTIFY'S PROFITABILITY DYNAMICS:

Marginal Revenue  
vs  
Marginal Cost



# Key Insights: Marginal Revenue vs. Marginal Cost



**Volatile Marginal Cost (MC):** Significant cost fluctuations indicate operational inefficiencies



**Stable Marginal Revenue (MR):** Premium Revenue consistently outperforms Ad Revenue



**Profitability Gap:** Losses occur when MC exceeds MR, highlighting cost control issues



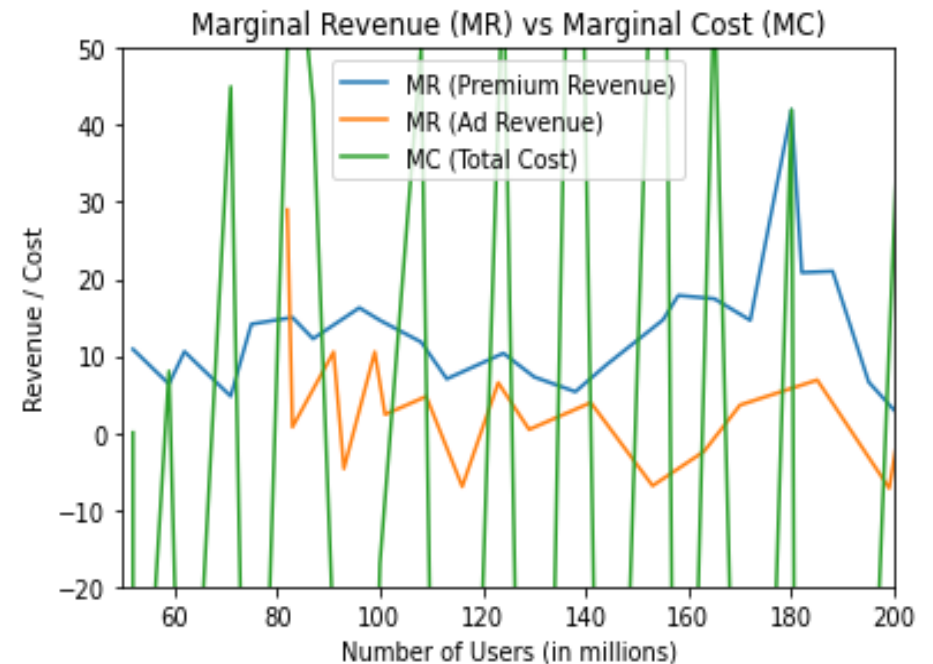
**Cost Optimization:** Improve resource allocation to reduce MC volatility



**Scale Challenges:** Fluctuating MC suggests inefficiencies as user numbers grow



**Actionable Insights:** Focus on cost reduction, revenue diversification, and operational efficiency



# Strategic Solutions for Profitability Optimization



**Optimize Operational Efficiency:** Streamline spending in key areas



**Enhance Premium Features:** Boost Revenue with new features



**Diversify Ad Revenue:** Strengthen ad monetization strategies



**Improve Scalability:** Align costs with user growth

# Potential Tracking of Outcomes

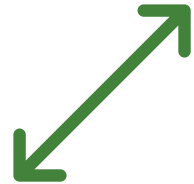
- **Operational Cost Trends:** Track key operational cost fluctuations
- **Revenue Growth:** Analyze Premium and Ad Revenue changes
- **Profitability Ratios:** Compare margins pre- and post-changes
- **User Metrics Analysis:** Monitor acquisition, retention, and engagement



# Conclusions and Insights



**Optimizing operational costs** and **enhancing revenue strategies** are key to Spotify's profitability.



**Addressing cost fluctuations** and **leveraging premium and ad revenue opportunities** can enable Spotify to achieve sustainable growth and scalability





# Challenges

- Data Size
- Advanced Modelling limitations



The background of the slide is a dark green color, densely populated with a pattern of Spotify logos. The logos are circular and feature the characteristic three curved lines of the Spotify icon. They are rendered in a slightly lighter shade of green than the background, creating a subtle, repeating pattern.

# THANK YOU!

DO YOU HAVE ANY QUESTIONS?