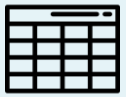
100Ki Google Search Demand
Honda & Acura

April 2023

Agenda

1. Forecast Methodology Overtime
2. Model Set up
3. Step by Step Google Search Methodology
4. Model Evaluation
5. Honda & Acura Forecasts
6. Goal Tree Expectation

Forecast Methodology Overtime



98ki Methodology: Manual Process

Manually constructed a plan to forecasted 98ki Google demand search volumes.

The methodology was driven by business knowledge.

99ki Methodology: Exponential Smoothing Time Series

Utilized exponential smoothing time series built in within Excel to capture seasonality.

Created a ruleset of weights depending on assumptions of PR announcements, model launches, and market trends of each model.

100ki Methodology: Random Forest

Utilized machine learning by building an algorithm called Random Forest for each Honda and Acura model.

The algorithm learns and adapts historical data to create 500 forecasting models called decision trees to make up a Random Forest.

Random Forest Model Set Up

Models

- **Honda:** CR-V (CR-V petrol & CR-V hybrid), Accord (Accord petrol & Accord hybrid), Pilot, Passport, Civic, Odyssey, Ridgeline, HR-V
- **Acura:** MDX, RDX, Integra, TLX

Monthly Variables

- **Dependent:** Google demand search volumes
- **Independent:** Count of Brand Campaign Days, Count of Model Campaign Days, Count of Competitor's launch, Total Model Media Spend, Total Brand Spend (excludes ZDX & Prologue), Count of PR announcements, Seasonality (monthly and yearly)

Adjustments

- Discounting data from March 2020 – April 2020 due to Covid seasonality

Train Data

- Utilized January 2020 – December 2022 data as a train dataset to build the random forest model

Google Search Target Methodology

Step 1

Data Collection

Collected **January 2020 – December 2022** historical Google Demand data.

Collected historical and planned **January 2020 – March 2024 variables** to build the forecasting model.

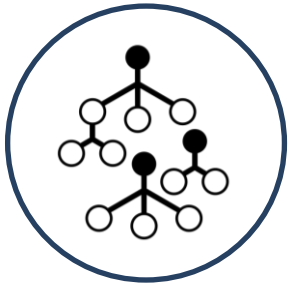
Step 2

Data Cleaning & Manipulation

Prepared data for manipulation.

Scaled data to normalize the range of independent variables.

Step 3



Random Forest Modeling

With **January 2020 – December 2022** dataset, created a personalized random forest algorithm for each model.

Random Forest consists of 500 decision trees, a tree-like model of decisions chosen by evaluating the smallest margin of error.

Step 4

Google Demand Search Volume Prediction

Forecasted **April 2023 – March 2024** Google demand search volumes for 100ki Goal Setting.

Media Spend plan excludes Prologue/ZDX spend

Model Evaluation

Random Forest Model Error

Train Data January 2020 – March 2022

Honda	
Actual April 2022 – January 2023 Demand	[redacted]
Projected April 2022 – January 2023 Demand	[redacted]
Forecasted Error	[redacted]

Acura	
Actual April 2022 – January 2023 Demand	[redacted]
Projected April 2022 – January 2023 Demand	[redacted]
Forecasted Error	[redacted]

Search query volume is "masked" and does not reflect actual volume; however, the relative change YoY sales accurately

Honda Google Search Target by Model & Month

100ki Monthly Google Demand Forecast

Model	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	100ki
Civic	[redacted]												
CR-V*	[redacted]												
Accord*	[redacted]												
Pilot	[redacted]												
HR-V	[redacted]												
Odyssey	[redacted]												
Ridgeline	[redacted]												
Passport	[redacted]												
Total	[redacted]												

100ki Forecast vs 99ki Actual

100ki YTD vs 99ki YTD	99ki (April-February)	100ki (April-February)
[redacted]		

Accord FMC Sustain Campaign

CR-V Hybrid/ HR-V Sustain Campaign

- Honda's search demand is forecasted to be down [redacted] in 100ki (April-February) vs 99ki (April-February).
- Passport and Ridgeline demand levels are expected to be up [redacted] aligning with Rugged Ph7 support from November to December 2023.
- Ridgeline is expected to see the largest FoF (fiscal year over fiscal year) percent increase in demand aligned with the model having the largest increase in model media spend.
- HR-V, CR-V, and Pilot are expected to see decreases FoF given they had elevated search demand in 99ki from their FMCs and media campaigns

**Hybrid models included*

Search query volume is "masked" and does not reflect actual volume; however, the relative change YoY sales accurately

Acura Google Search Target by Model & Month

100ki Monthly Google Demand Forecast

Model	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	100ki
MDX	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
TLX	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
RDX	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Integra	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

100ki Forecast vs 99ki Actual

100ki YTD vs 99ki YTD	99ki (April-February)	100ki (April-February)
[redacted]	[redacted]	[redacted]

- Acura's search demand is forecasted to be down [redacted] in 100ki (April-February) vs 99ki (April-February).
- Despite having an MDX Sustain campaign, the model is expected to decrease search volume by [redacted] aligned with the decrease in NFL sports TV media which has historically coincided with spikes in demand.
- Integra's search volume is expected to decrease by [redacted] coming off its model launch in 99ki but still be supported by Type S in April and May 2023.

Search query volume is "masked" and does not reflect actual volume; however, the relative change YoY sales accurately

100ki Honda & Acura Google Search Goals

100ki Google Search Demand Goal

Honda Search Volume Goals			
Q1	Q1-Q2	Q1-Q3	Q1-Q4
[redacted]	[redacted]	[redacted]	[redacted]

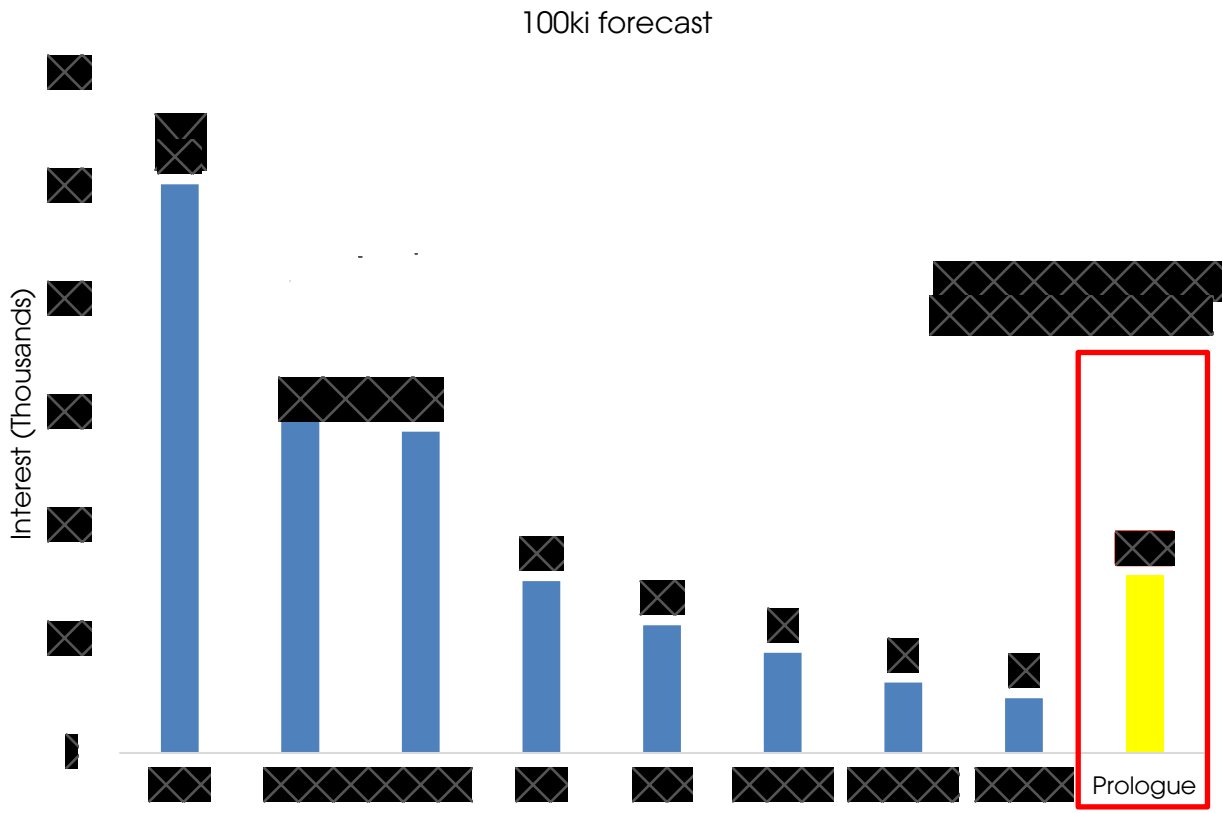
Acura Search Volume Goals			
Q1	Q1-Q2	Q1-Q3	Q1-Q4
[redacted]	[redacted]	[redacted]	[redacted]

Honda goal was adjusted by 6.3% to account for model error.
Acura goal was adjusted by 5.8% to account for model error.
Search query volume is "masked" and does not reflect actual volume; however, the relative change YoY sales accurately

Goal Tree Expectation

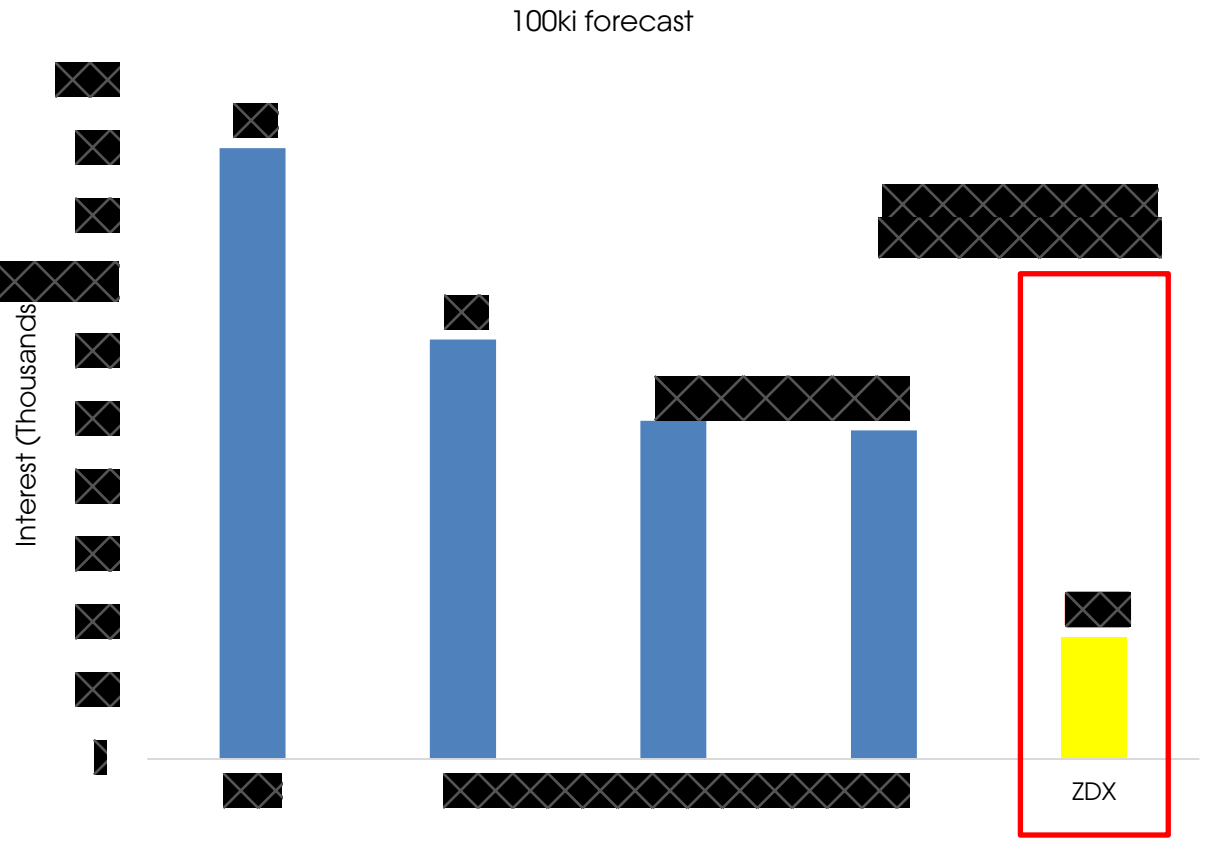
Honda

Prologue makes up less than [redacted]% of Honda searches in 99ki.
Prologue would need to increase and make up [redacted]% of total Honda searches to drive an increase in demand for Honda.



Acura

ZDX makes up about [redacted]% of Acura searches in 99ki.
ZDX would need to grow to [redacted]% of total Acura searches to bring Acura to increase fiscal year over fiscal year.



**Hybrid models included*
Search query volume is "masked" and does not reflect actual volume; however, the relative change YoY sales accurately