

AI-Powered Commerce

Building the products and services of the future with Commerce.AI



Preface

The future of commerce is here. AI-powered commerce is enabling businesses to offer new experiences and value to consumers. AI will play a critical role in the future of product and service innovation, transforming how brands engage with customers across multiple touchpoints.

Commerce.AI introduces you to the latest advances in AI and how it's being used to power new products and services across a variety of industries. You will learn about the latest advancements in AI, including deep learning, **generative adversarial networks** (or **GANs**), **natural language processing** (or **NLP**), and computer vision.

The book begins with an overview of different applications of AI for product and service innovation, including market opportunity identification, creating product ideas, and industry trend forecasting. You will then explore AI for innovation use cases across a number of industries, from consumer electronics to luxury goods. Finally, you'll learn how to use Commerce.AI's core features to empower your product and service teams to create innovative products and services that meet the needs of your customers.

Who this audiobook is for

This book will guide you through the process of product and service innovation, no matter your pre-existing skillset. Whether you're an AI developer, a product manager, an analyst, or a consumer insights professional, this book will teach you everything you need to use the power of AI for innovation.

What this audiobook covers

Chapter 1, *Improving Market Opportunity Identification*, focuses on using AI for market opportunity identification and how it can be used to better understand customers' interests ^[SEP] in addition to their needs and desires. This is an important step for any company looking to refine its value proposition, modify customer experience, or create new products or services.

Chapter 2, *Creating Product Ideas*, explains how to leverage AI and machine learning to find product ideas. We cover the concepts of NLP and large language models to generate product ideas. We explain how you can use AI to analyze market data to create relevant and in-demand product ideas.

Chapter 3, *Understanding How to Predict Industry-Wide Trends Using Big Data*, explains how to use advanced machine learning and data science techniques to predict future trends. It explains what big data is, how it's structured, and how you can leverage it to see into the future. This is vital to creating successful products or services because it helps you understand what consumers will want in the future.

Chapter 4, *Applying AI for Innovation – Luxury Goods Deep Dive*, explores how AI is used for innovation in the luxury goods industry. It explores how luxury goods companies are using this technology to create personalization, improve customer experience, and develop new products.

Chapter 5, *Applying AI for Innovation – Wireless Networking Deep Dive*, looks at how AI is used in the wireless networking industry. It explores how AI is applied to optimize KPIs such as star ratings, bestseller rankings, product sentiment, and conversion.

Chapter 6, *Applying AI for Innovation – Consumer Electronics Deep Dive*, analyzes how AI is used for innovation in the consumer electronics industry. It explores how this technology is applied to understand and optimize product positioning, brand research, idea generation, insights extraction, and more.

Chapter 7, *Applying AI for Innovation – Restaurants Deep Dive*, explains how data is a critical tool for restaurant innovation teams. You'll learn how to use data and AI to inform your restaurant strategy.

Chapter 8, *Applying AI for Innovation – Consumer Goods Deep Dive*, lays out how AI is being utilized in the consumer goods industry. It examines how AI can be used for consumer goods market intelligence, generating content, analyzing sentiment, and so much more.

Chapter 9, *Delivering Insights with Product AI*, is an exploration of Commerce.AI's Product AI features, which empower product innovation teams to research, develop, launch, and track winning products.

Chapter 10, *Delivering Insights with Service AI*, explores Commerce.AI's Service AI features, which enable service innovation teams to build next-generation experiences and reputation by truly understanding their customers and the rest of the market.

Chapter 11, *Delivering Insights with Market AI*, explores Commerce.AI's Market AI features, which enable teams to uncover facets, use cases, and topics to determine changing customer behavior, trending products, emerging brands, and new product opportunities.

Chapter 12, *Delivering Insights with Voice Surveys*, dives into Commerce.AI voice surveys, which use speech recognition and natural language understanding. You'll learn how to gain unparalleled insights into what consumers are thinking.

To get the most out of this audiobook

You will need a stable Internet connection and a Python-compatible IDE, on either Windows, macOS, or Linux. All code examples have been tested using Google Colaboratory. However, they will work with offline IDEs and other environments as well.

Software/hardware covered in the book	Operating system requirements
Commerce.AI	Any web browser
Python pandas and other libraries	Windows, macOS, or Linux
GPT-J	Windows, macOS, or Linux
AI21 Studio	Windows, macOS, or Linux

Note

If you are using the digital version of this book, we advise you to type the code yourself or access the code from the book's GitHub repository (a link is available in the next section). Doing so will help you avoid any potential errors related to the copying and pasting of code.

During or after reading the book, we encourage you to sign up for a free trial of Commerce.AI at <https://www.commerce.ai/contact>.

Download the example code files

You can download the example code files for this book from GitHub at <https://github.com/PacktPublishing/AI-Powered-Commerce>. If there's an update to the code, it will be updated in the GitHub repository.

We also have other code bundles from our rich catalog of books and videos available at <https://github.com/PacktPublishing>. Check them out!

Download the color images

We also provide a PDF file that has color images of the screenshots and diagrams used in this book. You can download it here: https://static.packt-cdn.com/downloads/9781803248981_ColorImages.pdf.

Conventions used

There are a number of text conventions used throughout this document.

Code in text: Indicates code words in text, database table names, folder names, filenames, file extensions, pathnames, dummy URLs, user input, and Twitter handles. Here is an example: "Take a look at more positive reviews, with a positive **polarity** and fairly low **subjectivity**."

A block of code is set as follows:

```
s = df['Reviews']
df['Reviews'] = df['Reviews'].astype(str)
df = df[df['Reviews'] == s]
df[['polarity', 'subjectivity']] = df['Reviews'].apply(lambda Text:
pd.Series(TextBlob(Text).sentiment))
```

When we wish to draw your attention to a particular part of a code block, the relevant lines or items are set in bold:

```
s = df['Reviews']
df['Reviews'] = df['Reviews'].astype(str)
df = df[df['Reviews] == s]
df[['polarity', 'subjectivity']] = df['Reviews'].apply(lambda Text:
pd.Series(TextBlob(Text).sentiment))
```

Bold: Indicates a new term, an important word, or words that you see onscreen. For instance, words in menus or dialog boxes appear in **bold**. Here is an example: "Even positive reviews complain about the range, such as one review that says simply **Good short range**."

Chapter 1

Figures

Market Reports

Fast moving AI-extracted insights about competitors, trends and opportunities
in thousands of markets.

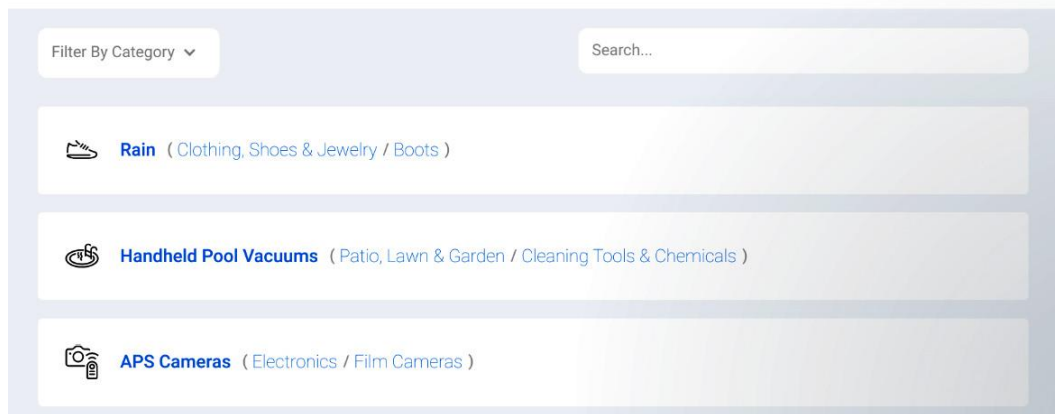


Figure 1.1 – A sample of Commerce.AI's AI-generated market reports

AI Generated Summary

Our data analytics platform provides a 360 view of all consumer markets. We monitor online channels and provide structured data to the industry. Our monitoring identified 1,986,480 datapoints for the Kabuki Brushes category. There was an opportunity level of 53 for a new brand or product in this sector. We detected increased sales in the Kabuki Brushes with an opportunity level of 53 with 288 products.

Fast Growing Brands

Daubigny, e.l.f., KESHIMA, EcoTools, Existing Beauty, TEXAMO, Coco & Eve

Bestseller

Large Flat Top Kabuki Foundation Brush By Keshima - Premium Makeup Brush for Liquid, Cream, and Powder - Buffing, Blending, and Face Brush, 1.6" Top Diameter **(4.6 stars, \$10.00, 17,821 ratings)**

OPPORTUNITY METER



BRANDS

7+

PRODUCTS

288+

REVIEWS

16,389+

Figure 1.2 – A sample AI-generated market report

Chapter 2

Figures

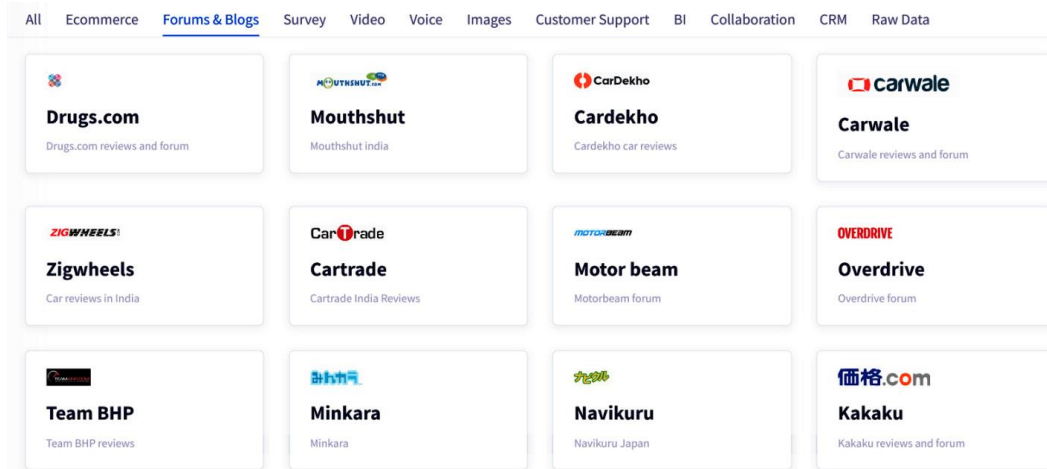


Figure 2.1 – A sample of customer data sources

Feed Summary

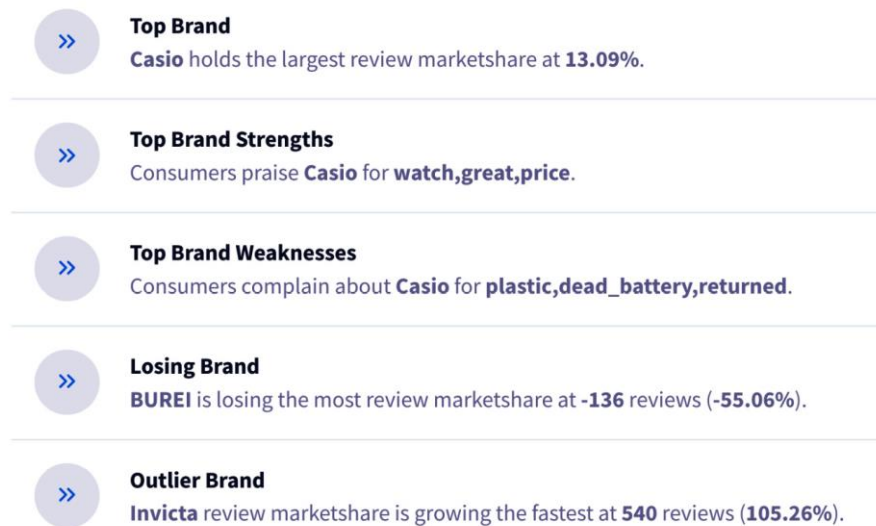


Figure 2.2 – A sample of organized information about watch brands

Product Category: Men's Wrist Watches

Customer Wishlist:

- × I just wish the hands glowed.
- × Just wish it had a metal caseback

Creativity (100=Wildest): 0 60 100

Generate

GENERATED IDEAS

SAVE PRODUCT IDEA

Copy A carbon steel watch with a glowing face. Under each hour, you have a number of dots that light up in sequence from left to right, then back to the left again when it reaches 12.

Figure 2.3 – Generating product ideas based on a customer wishlist



Figure 2.4 – A generative design by Emmanuel Touraine, CC BY-SA 4.0 (<https://creativecommons.org/licenses/by-sa/4.0>)

Chapter 3

Technical requirements

You can download the latest code samples for this chapter from this book's official GitHub repository at <https://github.com/PacktPublishing/AI-Powered-Commerce/tree/main/Chapter03>.

Figures

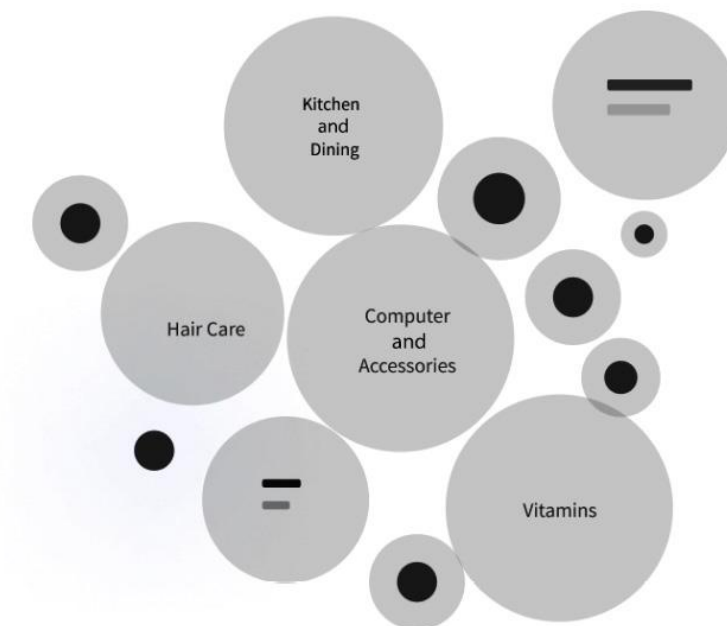


Figure 3.1 – Trending market segments

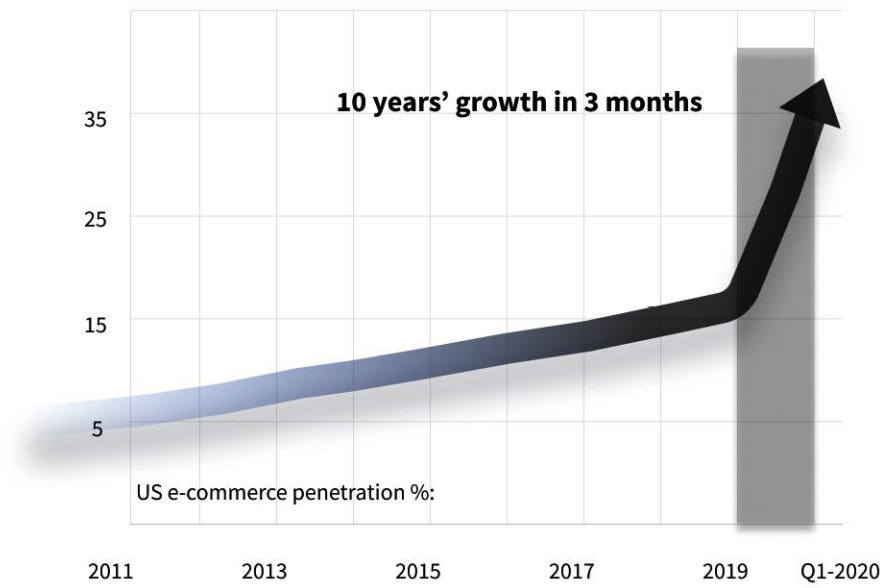


Figure 3.2 – US e-commerce penetration growth

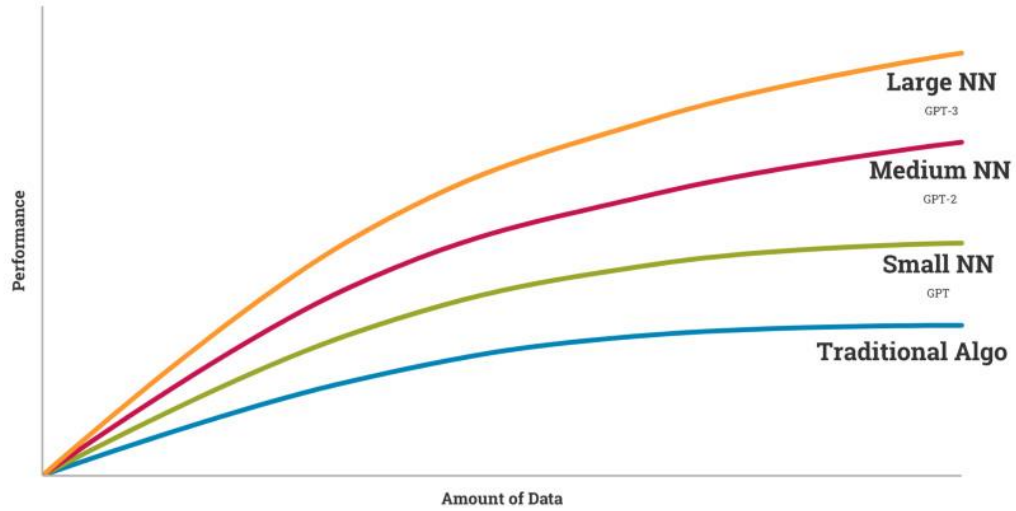


Figure 3.3 – ImageNet accuracy versus model size

Sentiment Over Time

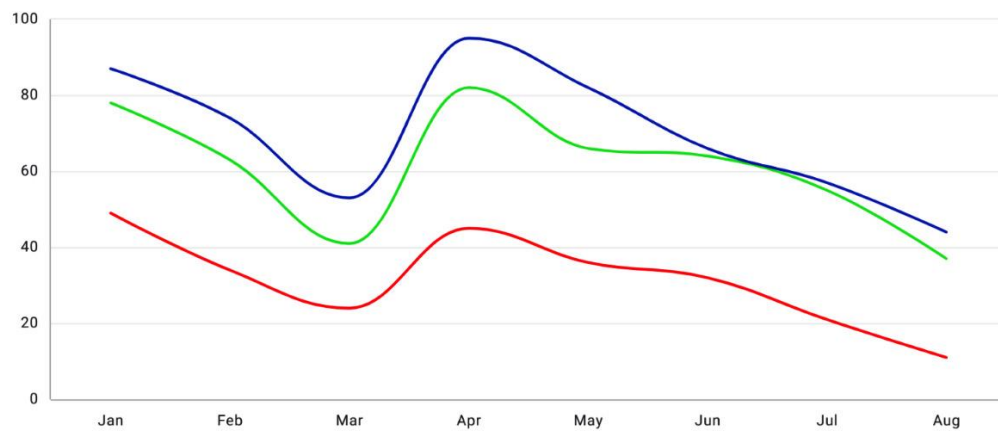


Figure 3.6 – Sentiment of Yeezy sneaker reviews over time

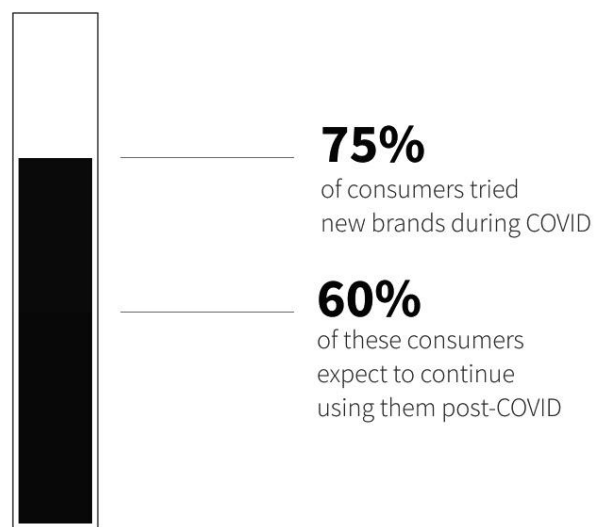


Figure 3.7 – Consumer statistics



Figure 3.8 – Map of major commerce data sources

Example: Forecasting demand for Adidas Yeezy sneakers

Let's walk through a practical example of forecasting demand for Adidas Yeezy sneakers.

1. First, we'll import the libraries that we need, which are Python's pandas for data manipulation and Facebook's Prophet, an AI forecasting library:

```
import pandas as pd
from fbprophet import Prophet
```

2. Next, we'll import our data – 5 years of worldwide search history for the term **Yeezy**, retrieved using Google Trends (<https://trends.google.com/>):

```
df = pd.read_csv("multiTimeline.csv")
```

Here's what the associated data looks like:

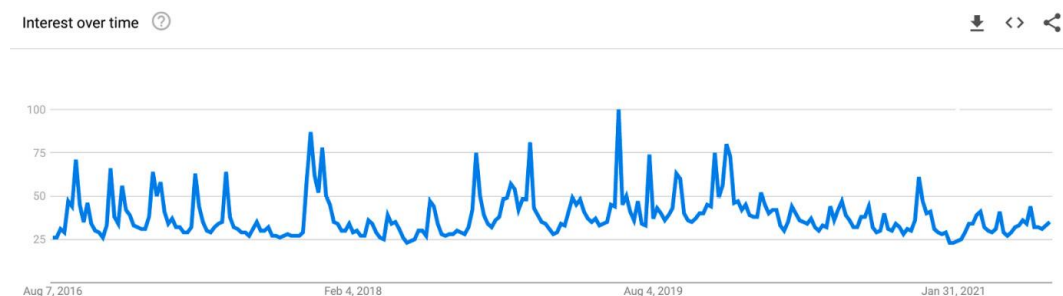


Figure 3.4 – Google Trends interest over time for the search term Yeezy

3. The preceding graph shows us search trends for the term **Yeezy**, which we now have to turn into a format that we can forecast from. Prophet requires that the datetime column is named **ds** and that the observation column is named **y**, so we'll rename both columns:

```
df = df.rename(columns = {"Week": "ds", "yeezy:
(Worldwide)": "y"})
```

4. Building an out-of-the-box model is just two lines of code, where we first instantiate the model and then fit it to the data:

```
m = Prophet()
m.fit(df)
```

5. Now that we've built a forecasting model, it's time to make a forecast. We'll make an empty DataFrame to store forecasted values, and then fill that DataFrame with the predicted values:

```
future = m.make_future_dataframe(periods=52, freq='W')
forecast = m.predict(future)
```

6. Now, we can plot our forecast with a single line of code:

```
fig1 = m.plot(forecast)
```

With that, we've successfully predicted demand for a given product. Here's what the resulting forecast graph looks like:

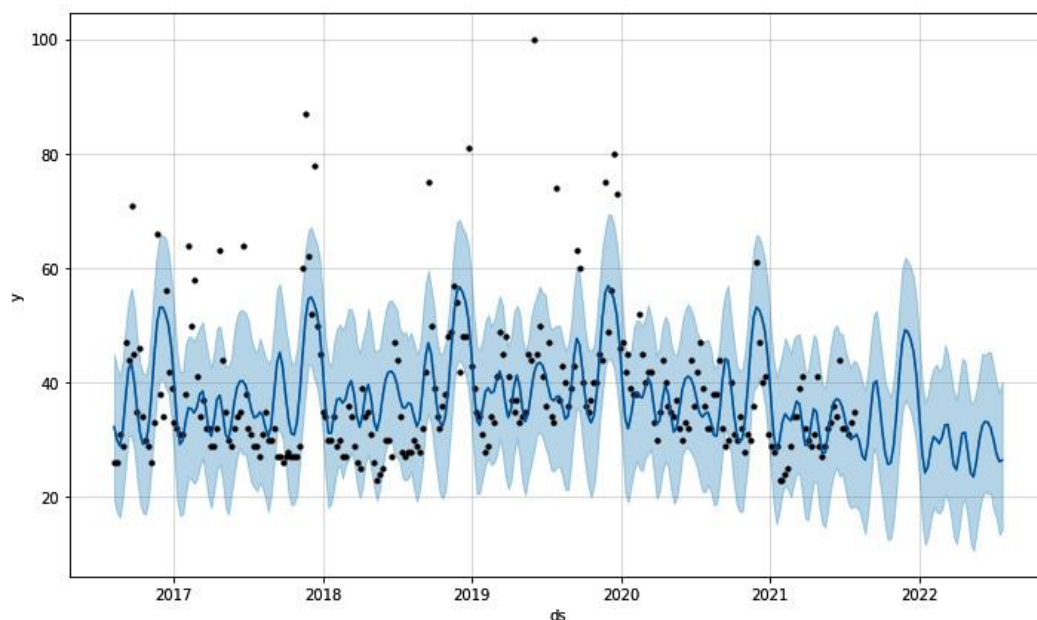


Figure 3.5 – A Facebook Prophet 1-year forecast of search demand for Yeezy

The preceding graph shows a 1-year forecast of Google Search interest for the product **Yeezy**. The same steps could be replicated for any product and any timespan or scaled to forecast demand across entire product lines or even market segments.

Code

Code 3.1 – Implementing the bert-base-multilingual-uncased-sentiment model concerning sentiment analysis

```
from transformers import pipeline

st = f"I like Yeezy"

seq = pipeline(task="text-classification", model='nlptown/bert-base-multilingual-uncased-sentiment')

print(f"Result: { seq(st) }")
```

Code 3.2 – Sentiment classification library by TextBlob

```
from textblob import TextBlob

text = "I just bought Yeezys and am absolutely in love!"

blob = TextBlob(text)

print(blob.sentiment)
```

Chapter 4

Technical requirements

You can download the latest code samples for this chapter from this book's official GitHub repository at <https://github.com/PacktPublishing/AI-Powered-Commerce/tree/main/Chapter04>.

Links

The luxury market: <https://www.statista.com/study/61582/in-depth-luxury/>

Code

Code 4.1 – Installing GPT-J

```
!pip install gptj  
  
from GPTJ.Basic_api import SimpleCompletion
```

Code 4.2 – Prompt

```
prompt = "Recommend a fashion item based on a list of clothes  
item.\n##\nWearing: Floral skirt\nFashion item: Try a black-and-  
white polkadot shirt for the classic floral and dot  
combo!\n##\nWearing: Blue denim jacket\nFashion item: Try golden  
yellow eye-shadow for a warm blue and gold glow!\n##\nWearing:  
Red lipstick\nFashion item: Pair your red lipstick with a red  
dress and red heels for a triple threat!\n##\nWearing: " + item +  
"\nFashion item:"
```

Code 4.3

```
temperature = 0.4  
  
top_probability = 1.0  
  
max_length = 15  
  
item = "Orange shorts"
```

Code 4.4

```
query = SimpleCompletion(prompt, length=max_length,  
    t=temperature, top=top_probability)  
Query = query.simple_completion()  
lines = Query.splitlines()  
results = []
```

Figures

Canvas [🔗 Quickstart](#)

Recommend a fashion item based on a list of clothes item.

Wearing: Floral skirt
Fashion item: Try a black-and-white polkadot shirt for the classic floral and dot combo!

Wearing: Blue denim jacket
Fashion item: Try golden yellow eye-shadow for a warm blue and gold glow!

Wearing: Red lipstick
Fashion item: Pair your red lipstick with a red dress and red heels for a triple threat!

Wearing: Orange shorts
Fashion item: **Try a floral top and sandals for a cute, summery look!**

Figure 4.1 – The AI21 Studio canvas as a fashion adviser

Configuration

Model

j1-jumbo (178B) ▼

Max completion length 40

1 2048

Temperature 0.37

0 1

Top P 0.98

0.01 1

Stop sequences

×

Figure 4.2 – The AI21 Studio Configuration panel

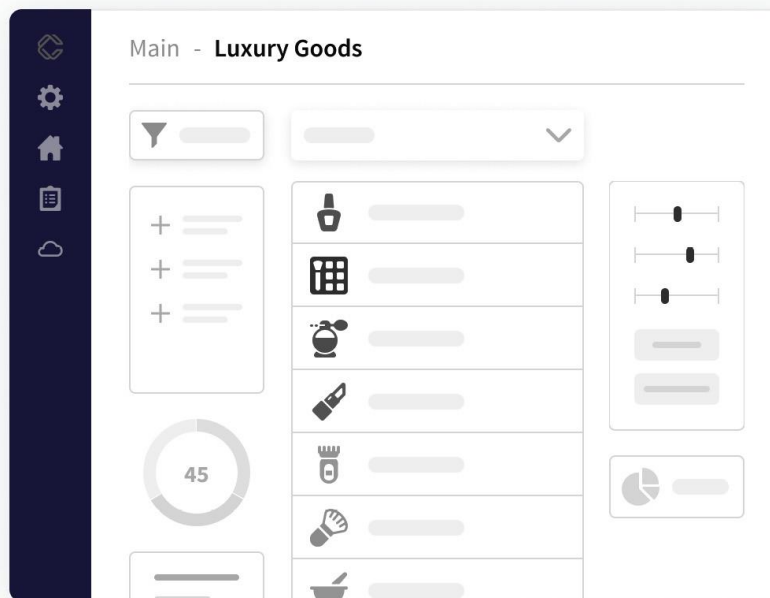


Figure 4.3 – A mock-up of a Commerce-dot-AI Luxury Goods dashboard

POPULAR ATTRIBUTES

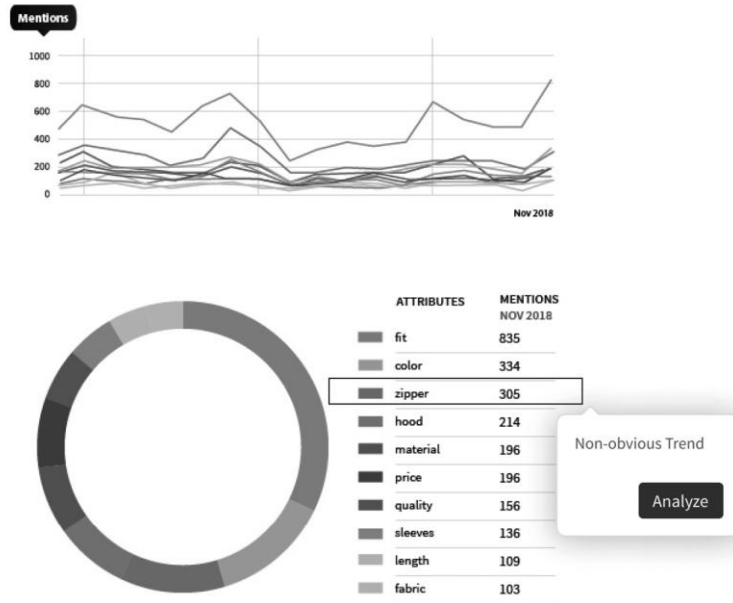


Figure 4.4 – An example of luxury brand attribute analysis



Figure 4.5 – A mock-up forecast of luxury brand trends

Chapter 5

Technical requirements

You can download the latest code samples for this chapter from this book's official GitHub repository at <https://github.com/PacktPublishing/AI-Powered-Commerce/tree/main/Chapter05>.

Figures

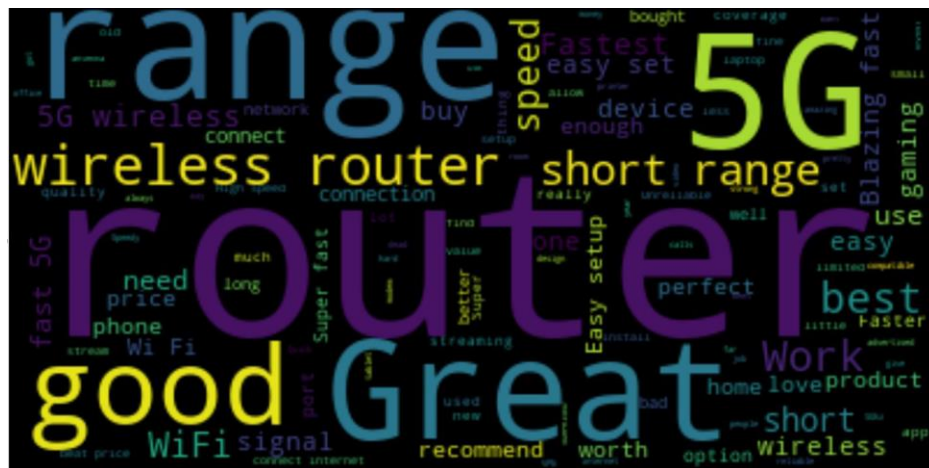


Figure 5.1 – A word cloud of 5G wireless router reviews

	Reviews	polarity	subjectivity
14	Short range and not worth the money	-0.075000	0.200000
21	This router has a limited range	-0.071429	0.142857
27	Range is not very far	-0.038462	0.769231
32	Biggest con - hard to set up	-0.291667	0.541667
57	The router's range is limited	-0.071429	0.142857

Figure 5.2 – A snippet of negative wireless router product reviews

163	Fastest router available	0.400	0.4000
179	Best router, good for gaming	0.850	0.4500
185	Good short range	0.350	0.4500
190	Best option for gaming	1.000	0.3000
193	This is the best router!	1.000	0.3000

Figure 5.3 – A snippet of positive wireless router product reviews

Key Performance Indicators (KPIs)

- ✓ Maintain or increase star rating trend
- ✓ Improve best sellers ranking
- ✓ Decrease time compiling weekly reports
- ✓ Improve product sentiment
- ✓ Improve conversion
- ✓ Improve search result ranking
- ✓ Improve detail page glance views

Figure 5.4 – Important KPIs for product teams

Code

Code 5.1 – Import dependencies

```
!pip install wordcloud
from os import path
from PIL import Image
from wordcloud import WordCloud, STOPWORDS
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
!pip install textblob
from textblob import TextBlob
```

Code 5.2 – Review product data

```
df = pd.read_csv('Reviews.csv')
document = df['Reviews'].to_string()
```

Code 5.3 – Generating a word cloud

```
wordcloud = WordCloud().generate(document)
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis("off")
```

Code 5.4 – We can now use **TextBlob** to analyze review sentiment and see whether we can find more meaningful insights.

```
s = df['Reviews']
df['Reviews'] = df['Reviews'].astype(str)
df = df[df['Reviews'] == s]
df[['polarity', 'subjectivity']] = df['Reviews'].apply(lambda Text:
pd.Series(TextBlob(Text).sentiment))
```

Code 5.5 – Sorting product reviews (negative reviews)

```
df[df['polarity'] < 0]
```

Code 5.6 – sorting positive product reviews

```
df[(df['polarity'] > 0.2) & (df['subjectivity'] < 0.5)]
```

Chapter 6

Figures



Figure 6.1 – A product positioning chart mockup comparing sentiment and number of reviews

AI Generated Summary

The DSLR Camera segment has an opportunity level of 54 with 1,992 products in the category. Amazon reported a steady increase in sales of consumer electronics whereas DSLR Cameras has a growing demand.

Fast Growing Brands

Canon, Nikon, Panasonic, Loupedeck, Fujifilm, Sony, Deal-Expo

Bestseller

Nikon D3500 W/ AF-P DX NIKKOR 18-55mm f/3.5-5.6G VR Black (4.8 stars, 2,991 ratings)

OPPORTUNITY METER



BRANDS

7+

Figure 6.2 – A snippet of an AI-generated market report on DSLR cameras

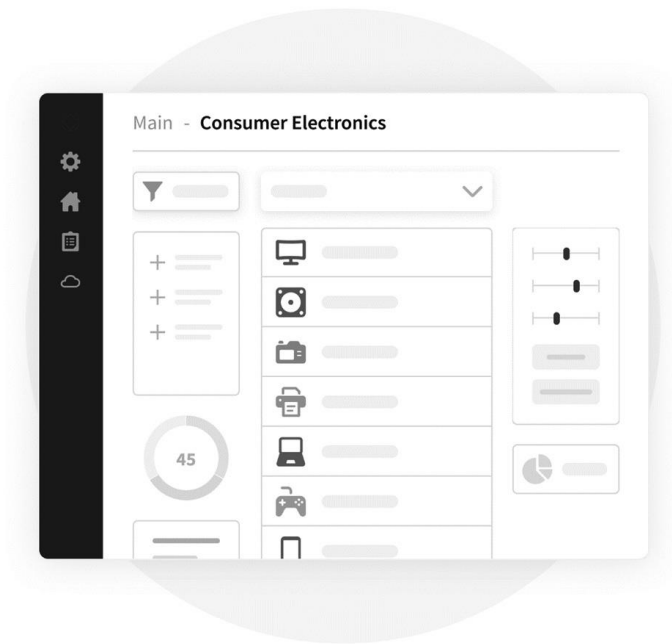


Figure 6.3 – A mockup of the blank slate Commerce.AI dashboard

Product Category

Customer Wishlist (Optional)

Creativity (100=Wildest)

Figure 6.4 – A product positioning chart mockup comparing sentiment and number of reviews

GENERATED IDEAS				
<input type="checkbox"/>	INDEX	SCORE	SAVE	PRODUCT IDEA
<input type="checkbox"/>	10	★★★★★	Copy	A DSLR that responds to voice commands, making it easy to get pictures of the whole family.
<input type="checkbox"/>	9	★★★★★	Copy	The camera will be able to connect to a smartphone via Bluetooth and the user will be able to control the camera from the phone.
<input type="checkbox"/>	8	★★★★★	Copy	A camera that processes complex colors accurately with real-time AI automation.

Figure 6.5 – A snippet of AI-generated DSLR product ideas

Links

<https://www.statista.com/markets/418/topic/485/consumer-electronics/#overview>

Chapter 7

Figures

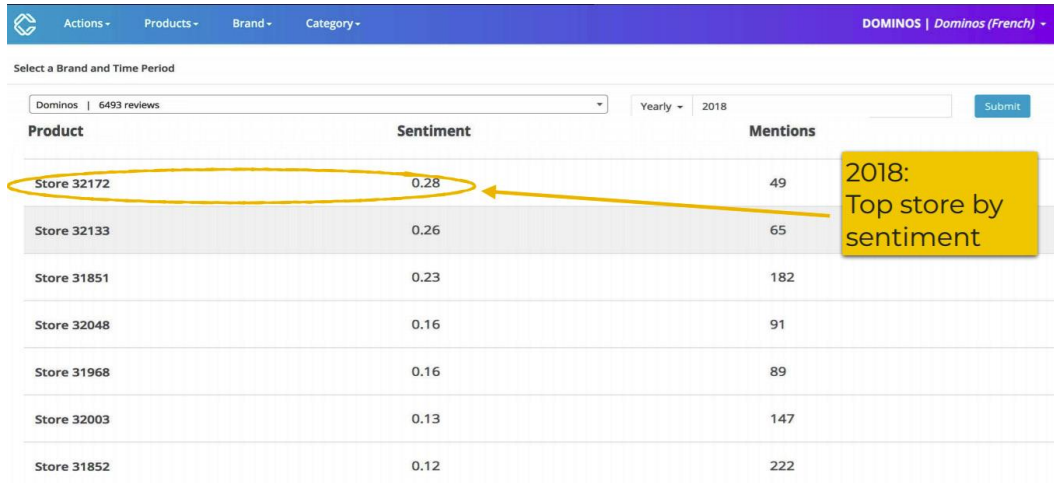


Figure 7.1 – Leaderboard of top stores by sentiment in Commerce.AI

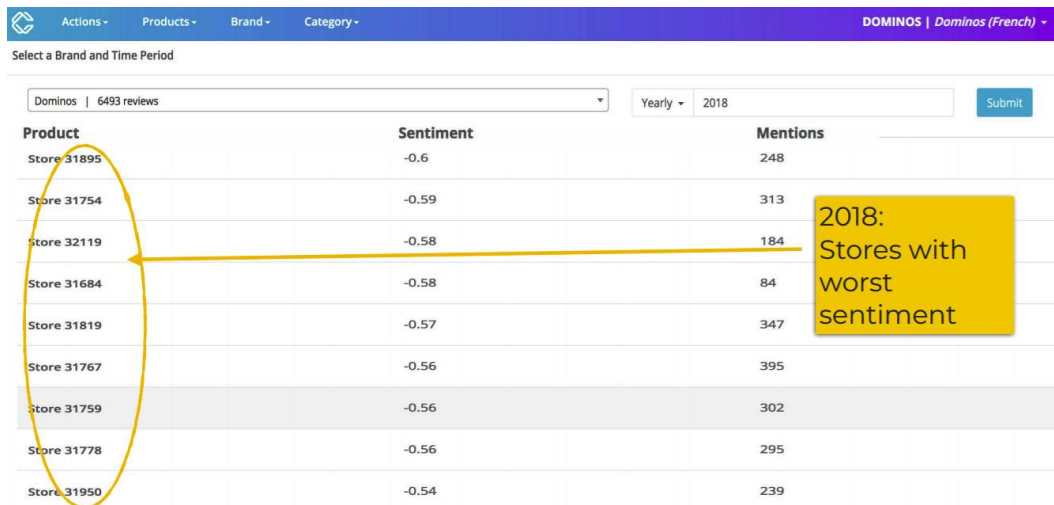


Figure 7.2 – Leaderboard of worst stores by sentiment in Commerce.AI

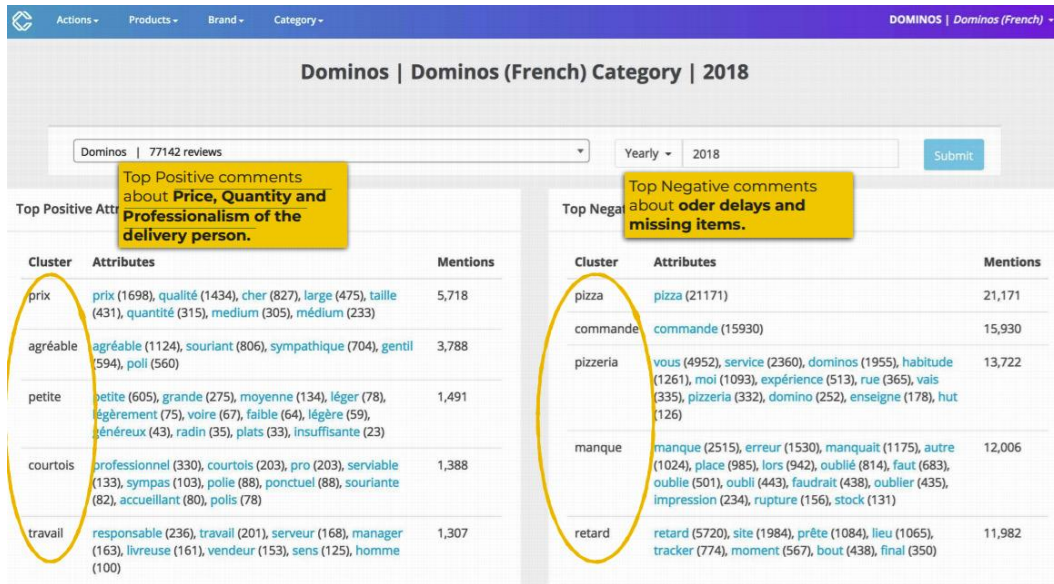


Figure 7.3 – Analyzing store attributes in Commerce.AI

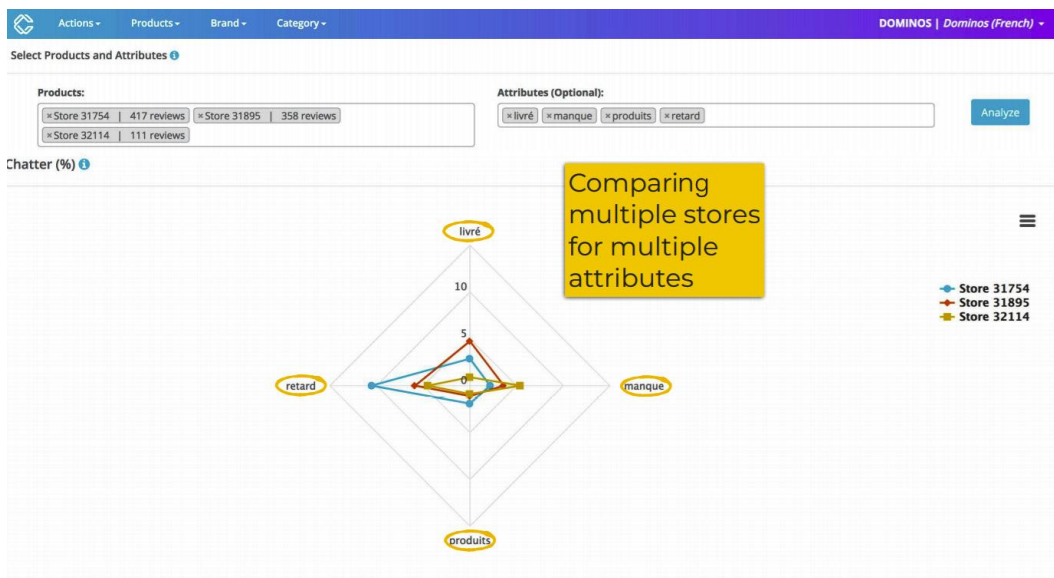


Figure 7.4 – Comparing multiple stores for multiple attributes



Fig 7.5 – A Commerce.AI mockup of a high-level consumer insights dashboard

Chapter 8

Technical requirements

You can download the latest code samples for this chapter from the book's GitHub repository:

<https://github.com/PacktPublishing/AI-Powered-Commerce/tree/main/Chapter08>

Code

Code 8.1 – Install GPT-J and import the required library:

```
!pip install gptj  
from GPTJ.Basic_api import SimpleCompletion
```

Code 8.2 – Next, we define this task by providing `prompt`, which includes examples of product descriptions being generated from a product name and features:

```
prompt = "Write one sentence descriptions for products based on a list  
of features.\n##\nProduct: Sundef\nFeatures:\n- Sunscreen for  
athletes\n- Unique formula to prevent burning eyes\n- Can be worn on  
the body and on the face\nOne sentence description: Sundef face & body  
sunscreen for athletes keeps your skin protected without hurting your  
eyes, so you can keep your head in the game.\n##\nProduct: " + product  
+ "\nFeatures:\n" + features + "\nOne sentence description:"
```

Code 8.3 – We'll want to pass a number of parameters, primarily `temperature` (or randomness), `max_length` (or the maximum output size of the model), and `product` (or what the user types in, such as `SlimWallet`):

```
temperature = 0.4  
top_probability = 1.0  
max_length = 5  
product = "SlimWallet"
```

Code 8.4 – Finally, we can now pass the `prompt` variable and the parameters to the model to create a recommendation. We'll also grab just the first line of text generated, in case the model goes overboard:

```
query = SimpleCompletion(prompt, length=max_length, t=temperature,
top=top_probability)

Query = query.simple_completion()

lines = Query.splitlines()

results = []
```

Figures

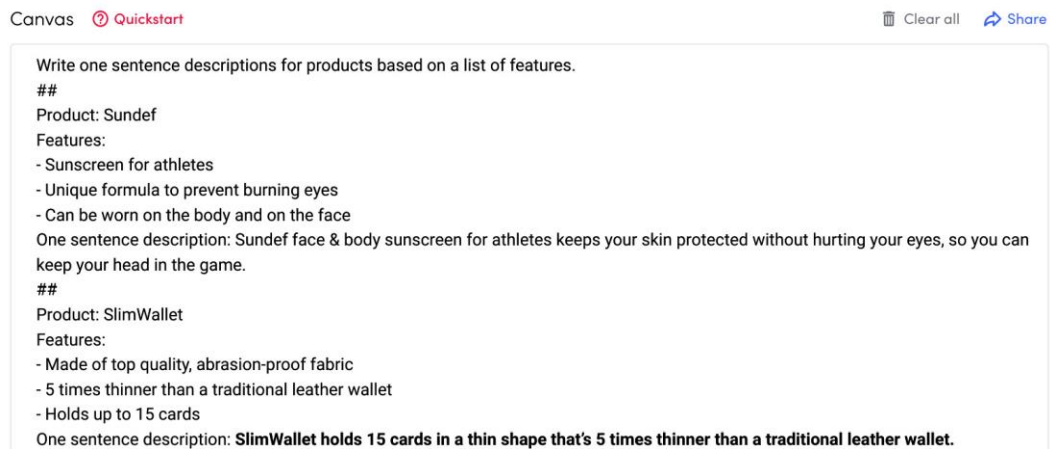


Figure 8.1 – The AI21 Studio canvas for product description generation

Configuration

Model

j1-jumbo (178B) ▼

Max completion length 40

1 2048

Temperature 0.37

0 1

Top P 0.98

0.01 1

Stop sequences

×

Figure 8.2 – The AI21 Studio Configuration panel

In **Figure 8.3**, we provide AI21 Studio with a prompt that extracts **Areas for improvement** from a product review:

Canvas Quickstart Clear all Share

Review: There is a reason this phone is half the price of other models since it's missing some luxury features. Apparently this phone isn't waterproof, which comes as a surprise to me since I've never known any phone to be waterproof and am always careful with my phones around water. Wireless charging capability is also missing from this phone so you may miss that feature if wireless charging is your thing. It really isn't a big deal though since the battery lasts so long this phone is rarely on the charger anyway.
Areas for improvement: [Waterproof, wireless charging]

###

Review: I just received this and have already experienced video call issues in terms of the quality, on whatsapp and duo. My callers get terribly pixelated videos of me that are so bad that they can't even see my face anymore. And other times it gets so blurry and visually noisy especially in low light settings, with a pixelated areas. I know it is not my internet speed because I've never experienced this before with my last pixel xl phone. I noticed this issue before the Android 11 update but it still continued afterwards. Nothing changes even after I restart. The phone is not even a day old. I'm not sure what to do now. I was so excited to finally receive the phone after waiting for so long, but this is unacceptable.
Areas for improvement: [Video calling]

###

Review: They claim phone battery last 24 hours, not even close. 12hours max so far with data and bluetooth turned off and shutting down some other bells and whistles. I don't use my phone much. I switch off the annoying gestures and put the home button on. It's easier to navigate that way. Spotify has crashed twice so far with this phone.
Areas for improvement: [Battery life]

Figure 8.3 – The AI21 Studio canvas for product review analysis

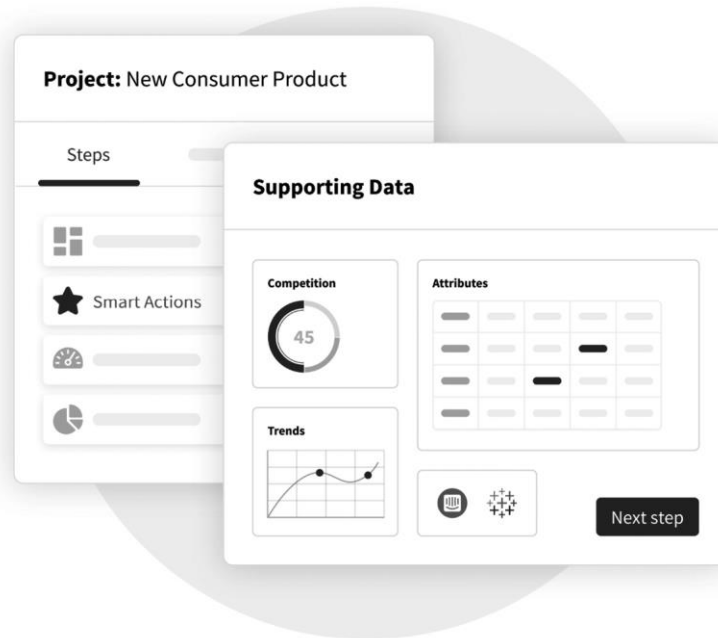


Figure 8.4 – A Commerce.AI mockup for measuring product attributes and trends

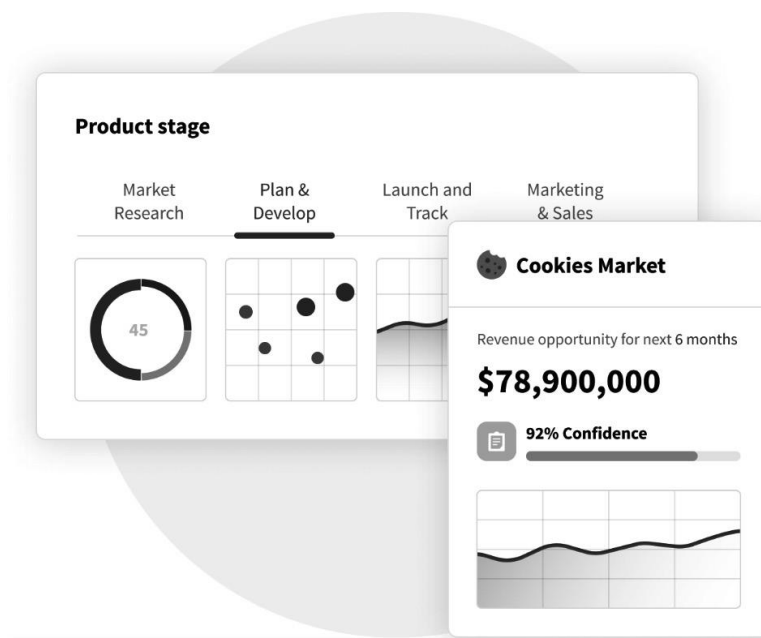


Figure 8.5 – A Commerce.AI mockup for measuring revenue opportunity



Figure 8.6 – A Commerce.AI mockup for analyzing personas and segments



Figure 8.7 – A Commerce.AI mockup for analyzing customer journeys

GENERATED IDEAS				
	INDEX	SCORE	SAVE	PRODUCT IDEA
	10	★ ★ ★ ★ ★	Copy	A high-protein, healthy alternative to traditional chocolate peanut butter bars, with the same creamy and crunchy consistency.
	9	★ ★ ★ ★ ★	Copy	A healthy oils potato chip without vegetable oils.
	8	★ ★ ★ ★ ★	Copy	A no-sugar, healthy-fat based yogurt.

Figure 8.8 – AI-generated product ideas around healthy snacks

Links

<https://nijianmo.github.io/amazon/index.html>

Chapter 9

Links

<https://www.commerce.ai/reports>

Figures

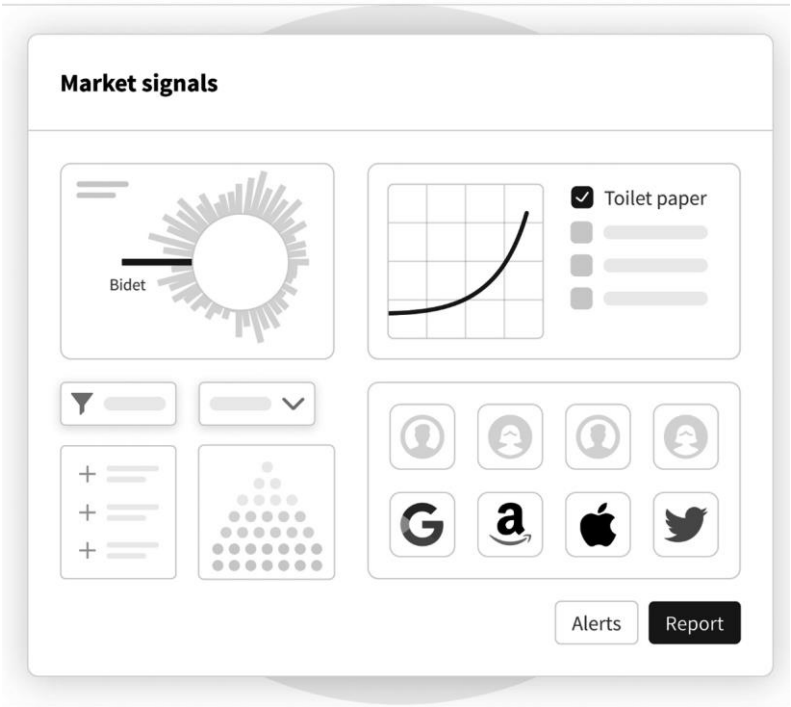


Figure 9.1 – A mockup of the Commerce.AI Market signals dashboard

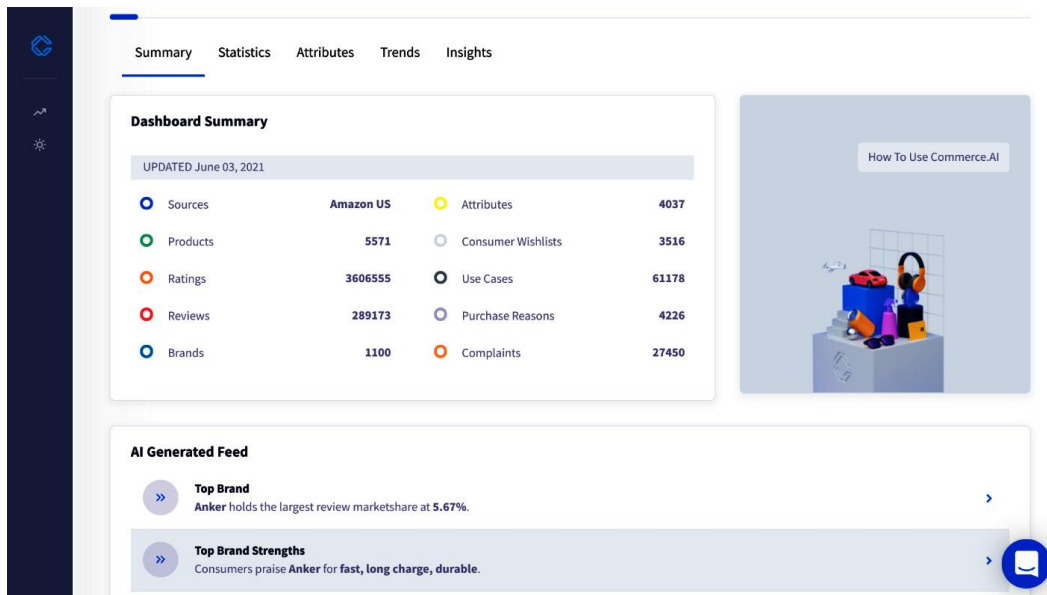


Figure 9.2 – Commerce.AI Dashboard Summary for wall chargers

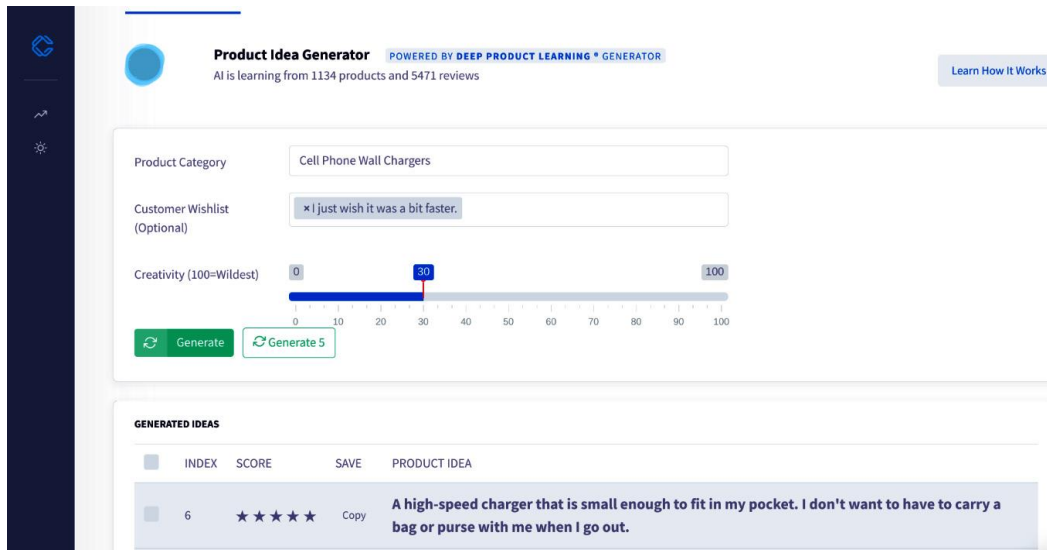


Figure 9.3 – The Commerce.AI Product Idea Generator

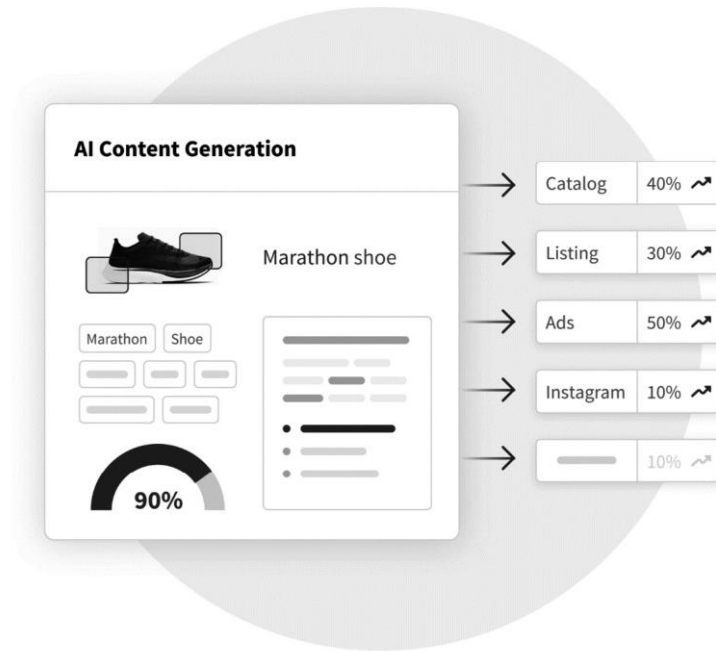


Figure 9.4 – A mockup showing Commerce.AI's AI Content Generation features

Chapter 10

Figures



Figure 10.1 – A mockup of Commerce.AI analysis for a telecom service

Chapter 11

Figures

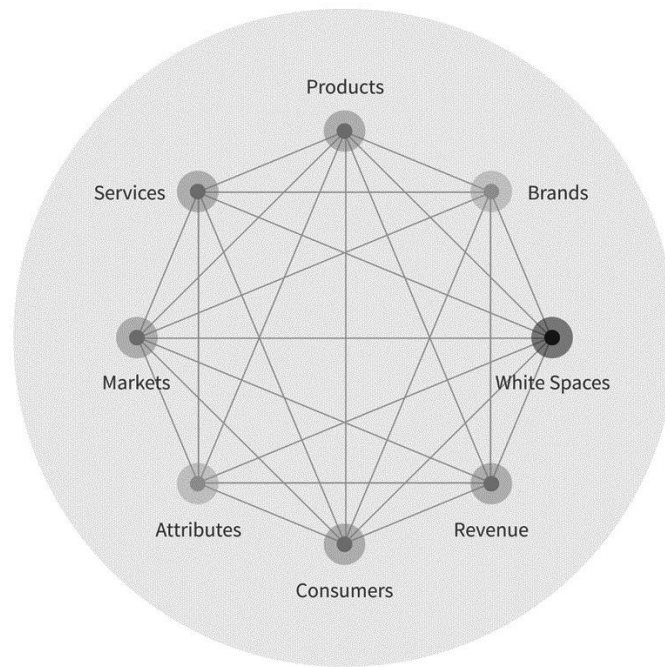


Figure 11.1 – A mockup of Commerce.AI white spaces analysis

Showing 3629 Products and 10686 Reviews

Men's Wrist Watches

Summary Statistics Attributes Trends Insights

Dashboard Summary

UPDATED July 21, 2021

Sources	Amazon US	Attributes	6717
Products	18344	Consumer Wishlists	3163
Ratings	4629132	Use Cases	14572
Reviews	279440	Purchase Reasons	16295
Brands	991	Complaints	26197

Figure 11.2 – A screenshot of Commerce.AI's market overview for men's wristwatches

Links

<https://thejournal.com/articles/2021/07/01/virtual-reality-headsets-see-explosive-growth.aspx>

Chapter 12

Figures



Figure 12.1 – A mock-up of a Commerce.AI voice survey