

EXPLORING GENERATIVE AI

Prof. Dr. Jan Kirenz

01 THE IMPACT OF GENERATIVE AI

GENERATIVE AI IS THE MOST IMPACTFUL TECHNOLOGICAL ADVANCEMENT SINCE THE INTERNET



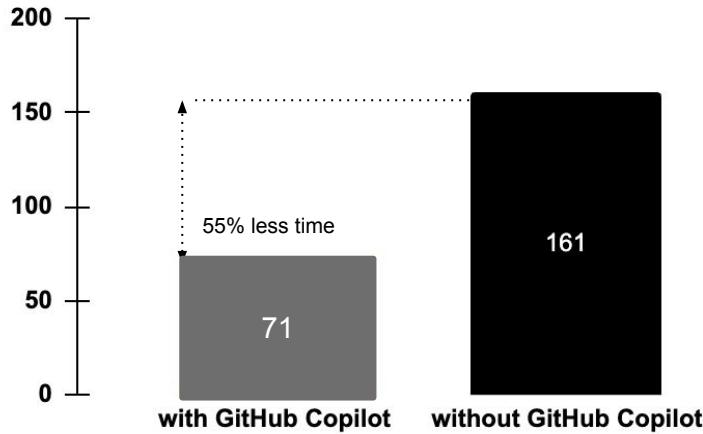
Source: [Forrester \(2023\). Forrester's Predictions 2024.](#)

GENERATIVE AI INITIATIVES WILL BOOST PRODUCTIVITY BY 50%



Source: [Forrester \(2023\). Forrester's Predictions 2024.](#)

IMPACT OF GENERATIVE AI ON TASK PRODUCTIVITY



GitHub Copilot



Task: Implement an HTTP server in JavaScript



Skills: Software development

Source: Peng et al. (2023). The Impact of AI on Developer Productivity: Evidence from GitHub Copilot

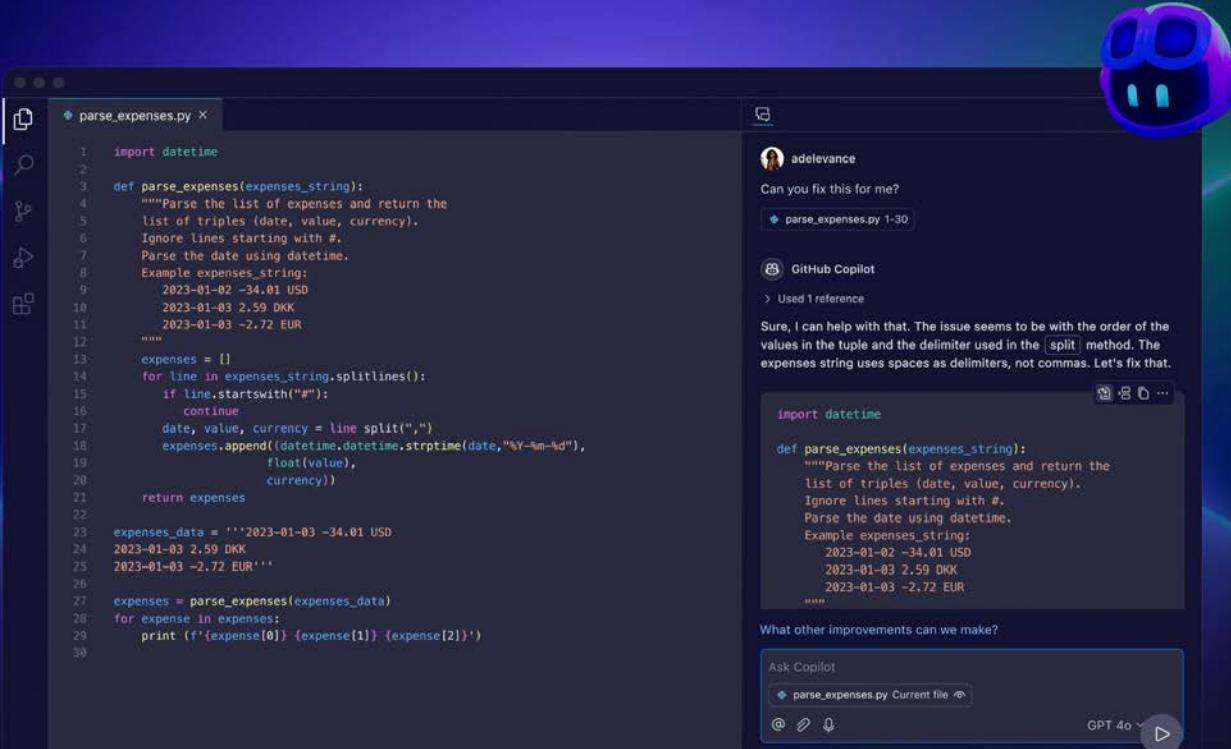
 GitHub Copilot is now available for free

The AI editor for everyone

[Get started for free](#)

[See plans & pricing](#)

Already have  Visual Studio Code? [Open now](#)



A screenshot of the GitHub Copilot interface within Visual Studio Code. The main area shows a Python script named `parse_expenses.py`. The code defines a function `parse_expenses` that parses a string of expenses into a list of tuples. A user message "Can you fix this for me?" is shown, followed by a file attachment of `parse_expenses.py`. GitHub Copilot responds with a message about fixing the tuple order issue. Below the main code editor, a preview window shows the corrected code with improved tuple creation. At the bottom, there's a prompt asking for more improvements and an "Ask Copilot" input field.

```
1 import datetime
2
3 def parse_expenses(expenses_string):
4     """Parse the list of expenses and return the
5     list of triples (date, value, currency).
6     Ignore lines starting with #.
7     Parse the date using datetime.
8     Example expenses_string:
9         2023-01-02 -34.01 USD
10        2023-01-03 2.59 DKK
11        2023-01-03 -2.72 EUR
12    """
13     expenses = []
14     for line in expenses_string.splitlines():
15         if line.startswith("#"):
16             continue
17         date, value, currency = line.split(",")
18         expenses.append((datetime.datetime.strptime(date,"%Y-%m-%d"),
19                           float(value),
20                           currency))
21     return expenses
22
23 expenses_data = '''2023-01-03 -34.01 USD
24 2023-01-03 2.59 DKK
25 2023-01-03 -2.72 EUR'''
26
27 expenses = parse_expenses(expenses_data)
28 for expense in expenses:
29     print(f'{expense[0]} {expense[1]} {expense[2]}')


import datetime

def parse_expenses(expenses_string):
    """Parse the list of expenses and return the
    list of triples (date, value, currency).
    Ignore lines starting with #.
    Parse the date using datetime.
    Example expenses_string:
        2023-01-02 -34.01 USD
        2023-01-03 2.59 DKK
        2023-01-03 -2.72 EUR
    """

What other improvements can we make?

Ask Copilot
@ ⚡ 🎧 GPT 4o ▶
```



GitHub Copilot



Visual Studio Code





Copilot for free!

GitHub Student Developer Pack

Learn to ship software like a pro. There's no substitute for hands-on experience. But for most students, real world tools can be cost-prohibitive. That's why we created the GitHub Student Developer Pack with some of our partners and friends.

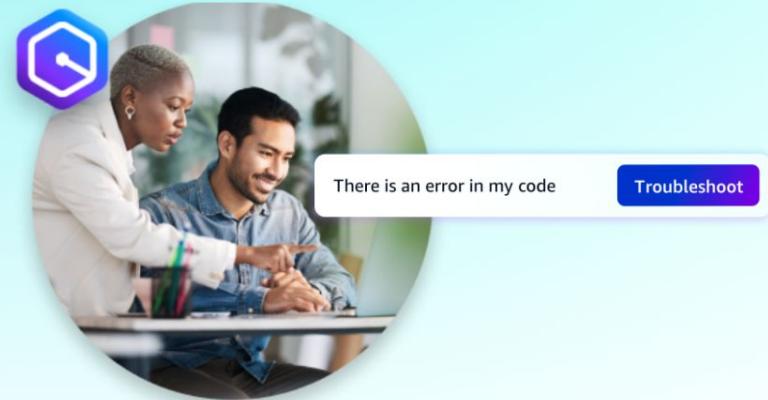
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Love the pack? Spread the word

[X Post](#)[Like 78K](#)

Amazon Q – Generative AI Assistant

The most capable generative AI-powered assistant
for accelerating software development and
leveraging companies' internal data



\$260 MIO IN ANNUAL COST SAVINGS

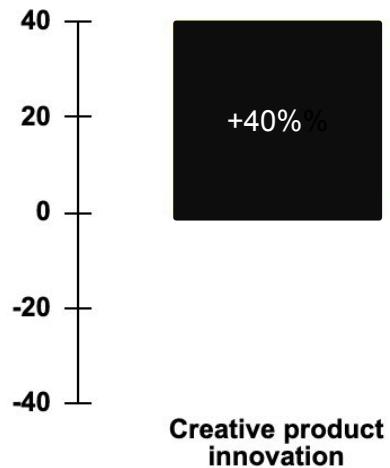


David Solomon

Chairman and CEO, Goldman Sachs

boost developer efficiency and productivity as much as **40%**

IMPACT OF GEN AI ON CREATIVE PRODUCT INNOVATION



Task: Brainstorm ideas for new products



Skill: Creativity

Source: [Dell'Acqua et al. \(2023\). Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality.](#)

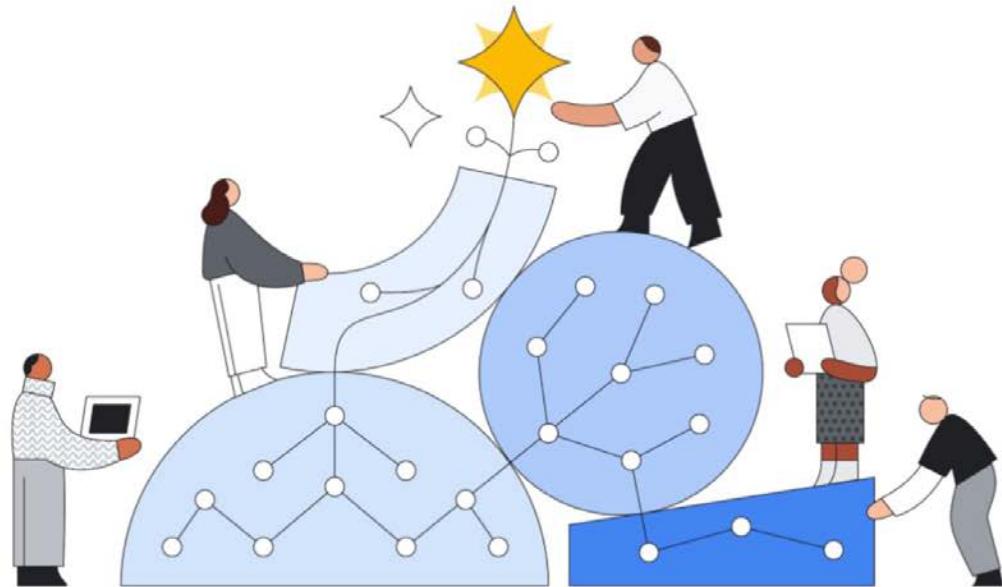
A black and white photograph of Steve Jobs, looking slightly upwards and to his right with a thoughtful expression. He is wearing thin-rimmed glasses and a dark turtleneck. His hands are clasped together in front of him. The background is dark.

**CREATIVITY IS JUST CONNECTING
THINGS.**

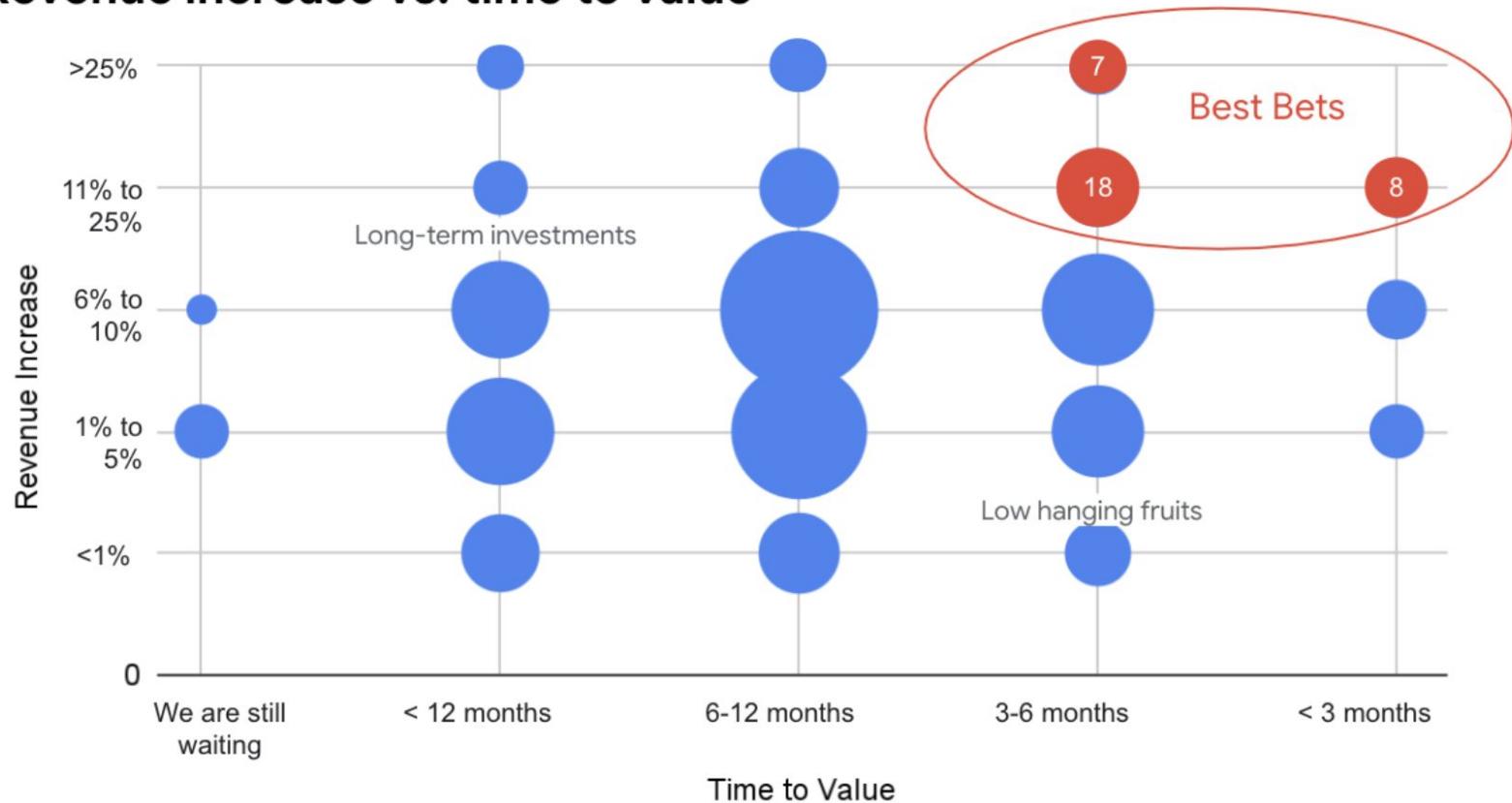
Steve Jobs

AI's Business Value: Lessons from Enterprise Success

January 13, 2025



Revenue increase vs. time to value



Revenue increase vs. time to value: "Best Bet" use cases impact revenue significantly and quickly.

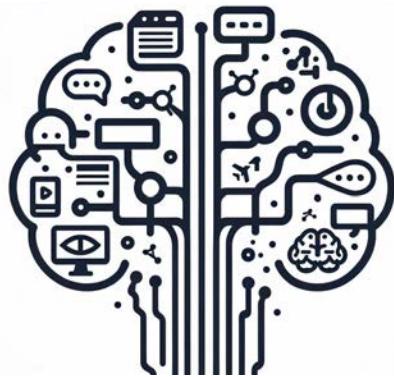
IMPACT OF GEN AI ON BUSINESS PROBLEM SOLVING



Source: Dell'Acqua et al. (2023). Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality.

THE LIMITS OF GENERATIVE AI

1+1=4



Factual errors: Creating information that is wrong.

Hallucinations: Generating information that is entirely made up.



Bias: AI can inherit biases from training data.



**FROM THIS POINT ON,
ARTIFICIAL INTELLIGENCE WILL
ONLY CONTINUE TO IMPROVE**

Source: [McAleese et al. \(2024\), LLM Critics Help Catch LLM Bugs, arXiv:2407.00215](#)

Maya

Sesame

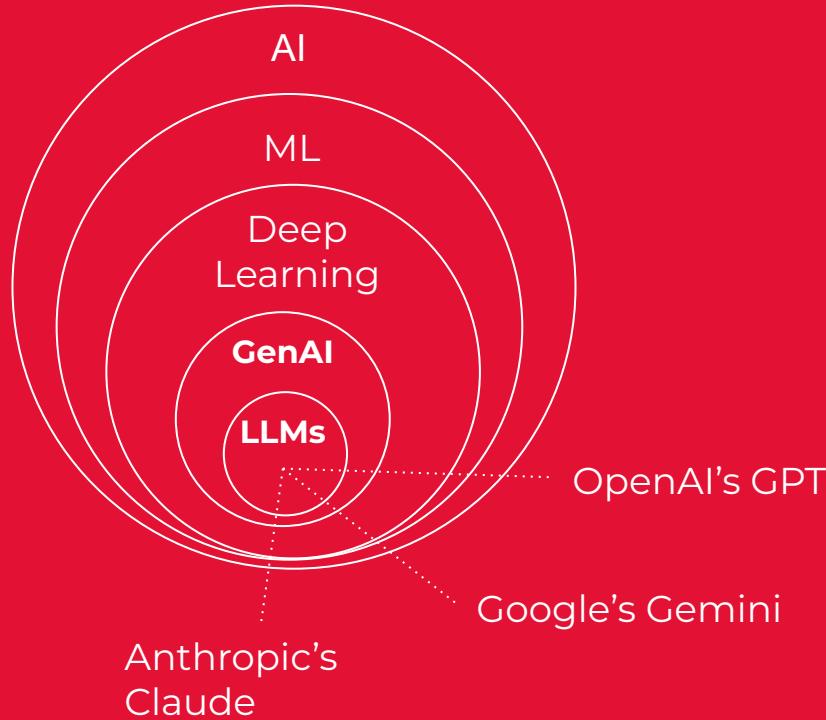




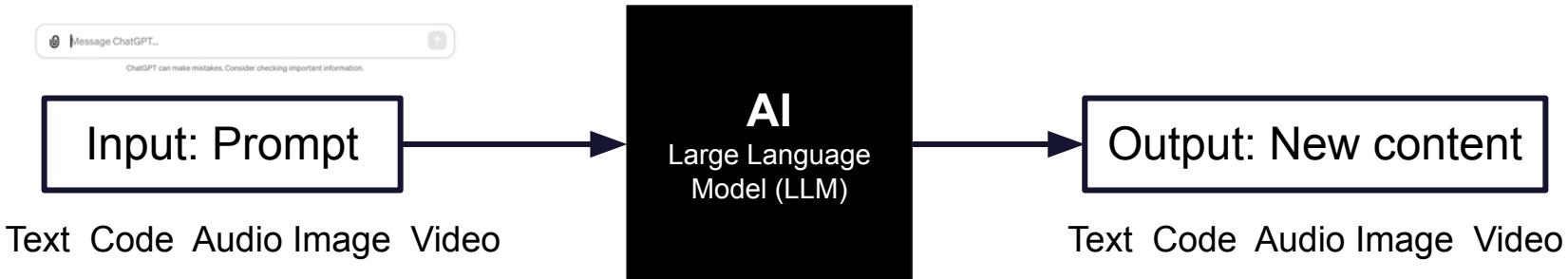
MEET NEO GAMMA

02 THE WORLD OF AI

UNDERSTANDING THE AI HIERARCHY



GENERATIVE ARTIFICIAL INTELLIGENCE (GEN AI)



(ARTIFICIAL) INTELLIGENCE

Scott Wu
CEO Cognition AI

Scott Wu | 2024



Scott Wu, CEO / Cognition AI
Human Software Engineer



What is the value of
 $255^2 - 245^2$?

Solve this problem

Let's solve the problem:

$$255^2 - 245^2$$

Use the algebraic identity:

$$a^2 - b^2 = (a + b)(a - b)$$

Applying this identity:

$$(255 + 245)(255 - 245) = (500)(10) = 5000$$

Answer: 5000

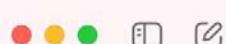


ChatGPT Nachricht senden

+

4.5





The digits 1, 2, 3, 4 and 5 can be arranged to form many different 5-digit positive integers with five distinct digits. In how many such integers is the digit 1 to the left of the digit 2? Two such integers to include are 14,352 and 51,234.

Solve this problem. Just give me the answer.

The answer is 60.



ChatGPT Nachricht senden

+

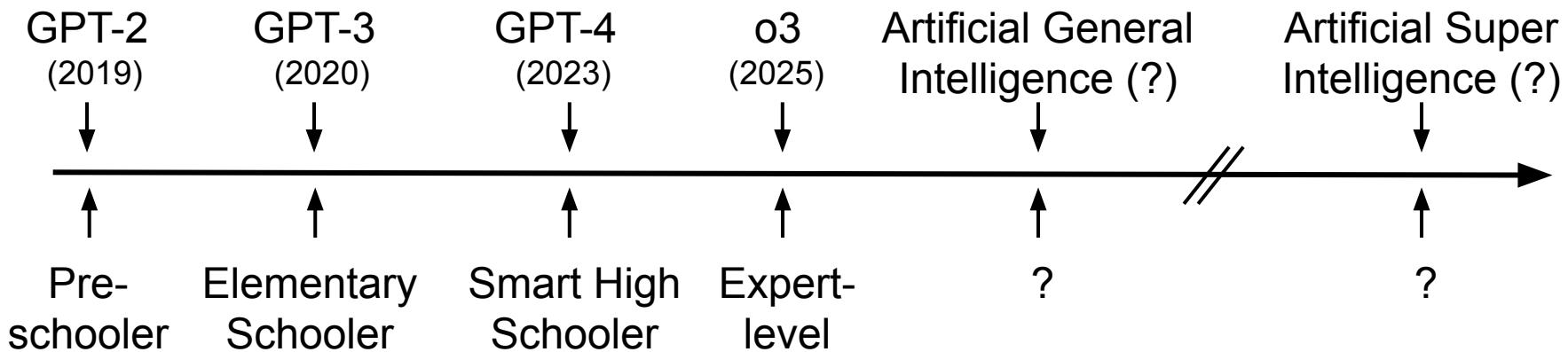


4.5



THE SCALE OF (ARTIFICIAL) INTELLIGENCE

Progress over just a few years



Source: based on Aschenbrenner (2024). Situational Awareness

THE TRANSFORMER ARCHITECTURE ENABLED LLMS

2017

Attention Is All You Need

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Abstract

The dominant sequence transduction models are based on complex recurrent or convolutional neural networks that include an encoder and a decoder. The best performing models also connect the encoder and decoder through an attention mechanism. We propose a new architecture that is entirely based on attention, based solely on attention mechanisms, dispensing with recurrence and convolutions entirely. Experiments on two machine translation tasks show these models to be superior in quality while being more parallelizable and requiring significantly less time to train. Our model achieves 28.4 BLEU on the WMT 2014 English-to-German translation task, improving over previous state-of-the-art ensemble models by over 2 BLEU. On the WMT 2014 English-to-French translation task, our model establishes a new single-model state-of-the-art BLEU score of 41.0 after training for 3.5 days on eight GPUs, a small fraction of the training costs of the best models from the literature.

1 Introduction

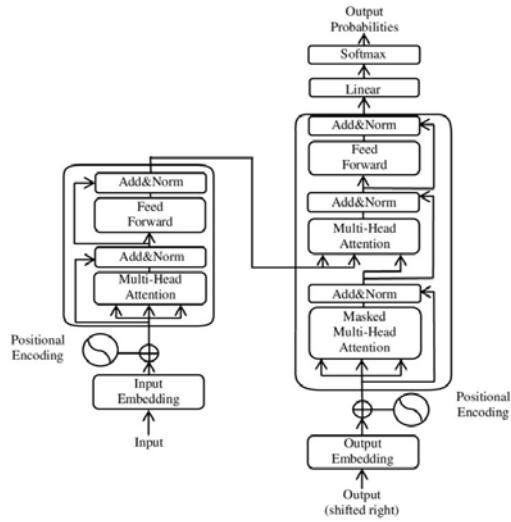
Recurrent neural networks, long short-term memory [12] and gated recurrent [7] neural networks in particular, have been firmly established as state of the art approaches in sequence modeling and transduction problems such as language modeling and machine translation [29, 2, 5]. Numerous efforts have continued to push the boundaries of recurrent language models and encoder-decoder architectures [31, 21, 13].

^{*}Equal contribution. Listing order is random. Jakob proposed replacing RNNs with self-attention and started the effort to evaluate this idea. Ashish, with Illia, designed and implemented the first Transformer models and has been crucially involved in every aspect of this work. Noam proposed scaled dot-product attention, multi-head attention, and the multi-head scaled dot-product attention mechanism. Lukasz has been involved in every detail. Niki designed, implemented, tuned and evaluated countless model variants in our original codebase and tensor2tensor. Llion also experimented with novel model variants, was responsible for our initial codebase, and efficient inference and visualizations. Lukasz and Aidan spent countless long days designing various parts of and implementing tensor2tensor, replacing our earlier codebase, greatly improving results and massively accelerating our research.

[†]Work performed while at Google Brain.

[‡]Work performed while at Google Research.

31st Conference on Neural Information Processing Systems (NIPS 2017), Long Beach, CA, USA.



An illustration of main components of the transformer model

Source: [Vaswani et al. \(2017\). Attention is all you need. Advances in neural information processing systems_30.](#)

Explore

Generate

My Library

Help

Feedback

Transform your content into engaging AI-generated audio discussions

Start generating

From research papers

Listen to a conversation about groundbreaking research papers.



e



AI and the
Opportunity for
Shared Prosperity:...

⋮

▶ 3m



⋮



The anatomy of a
large-scale
hypertextual Web...

▶ 4m



⋮



The Illusion of
Artificial Inclusion

▶ 7m



⋮



Large Language
Models Encode
Clinical Knowledge

▶ 3m



⋮



Sample of LLM
Research from
Google

▶ 8m



⋮



Attention Is All You
Need

▶ 4m



⋮

Show all

<https://illuminate.google.com/explore>



Let's unpack a paper titled Attention Is All You Need. What's the core idea here?

Well, the big idea in this paper is that we can build a really effective sequence transduction model without using recurrence or convolutions - the usual suspects, right? - and instead just rely on attention mechanisms. The paper shows that in the context of machine translation, this new approach not only performs better than RNNs but also trains faster.

That's super interesting, especially considering the time this paper was published. It's from 2017, right? What was the state of sequence models back then?

Exactly, 2017! Back then, everyone was all about RNNs - recurrent neural networks - think LSTMs and GRUs. These models were the top dogs for tasks like language translation and text summarization, you know? But these RNNs had a bit of a bottleneck. They were tough to train on long sequences because they had to process everything in order, one step at a time and that was a big limitation.

How did the Attention Is All You Need paper address this sequential processing bottleneck of RNNs?

So, instead of going step-by-step like RNNs, they introduced a model called the Transformer, hence the title. The Transformer processes the entire sequence all at once by using something called self-attention. It's like giving the model the ability to look at all parts of the input simultaneously and figure out which parts are most relevant to each other. Kinda like having a bird's eye view of the entire context, which is awesome for capturing those long-range dependencies between words in a sentence.

This self-attention mechanism sounds powerful! How does self-attention work in the Transformer model?

It's a bit like how we focus on different parts of a picture to understand it. Each word in the sequence looks at other words and assigns them different weights, kind of like voting for the most important words in the context. The really cool part is that these weights are learned by the model during training!

So it's a bit like the model is learning to focus on what's important - like a spotlight for language. Can you tell us a bit more about how the model learns these weights?

Yeah, it's all about the query, key, and value concept! These are vector representations for each word in the input sequence. The attention weight for each word is calculated based on the compatibility between the query and key vectors, typically using dot-product. The value vectors, weighted by the attention scores, are then combined to produce the output.

Are there any other advantages to using the Transformer model?



Attention Is All You Need



-4:24

Think Smarter, Not Harder

The ultimate tool for understanding the information that matters
most to you, built with Gemini 2.0

Try NotebookLM

Your Personalized AI Research Assistant

<https://notebooklm.google.com/>

Add sources

Sources let NotebookLM base its responses on the information that matters most to you.

(Examples: marketing plans, course reading, research notes, meeting transcripts, sales documents, etc.)



Upload sources

Drag & drop or [choose file](#) to upload



Supported file types: PDF, .txt, Markdown, Audio (e.g. mp3)

Google Drive

Google Docs

Google Slides

Link

Website

YouTube

Paste text

Copied text

Select all sources UTTC-2025

Exploring Generative AI: UTCC-2025

1 source

The presentation, delivered by Professor Jan Kirenz from the UTCC, explores the impact and potential of generative AI. It suggests that generative AI will be the most impactful technological advancement since the dawn of the Internet, boosting productivity considerably. The presentation also highlights the impact of generative AI on task productivity and creative product innovation, citing GitHub Copilot as a prime example, and revenue increase. Real-world marketing use cases and market forecasting scenarios are examined, particularly for optimising marketing processes using AI Agents and the tools and frameworks that can be used. The slides touch on software engineering, Open AI, and the importance of prompt development to achieve specific targets. The UTCC presentation concludes with some examples of how generative AI is set to continue to improve in coming years.



Exploring Generative AI: UTCC-2025



00:35 / 16:29

Interactive mode BETA

Notes



Saved notes will appear here

Save a chat message to create a new note or click Add note above.

Claude 3.7 Sonnet and Claude Code

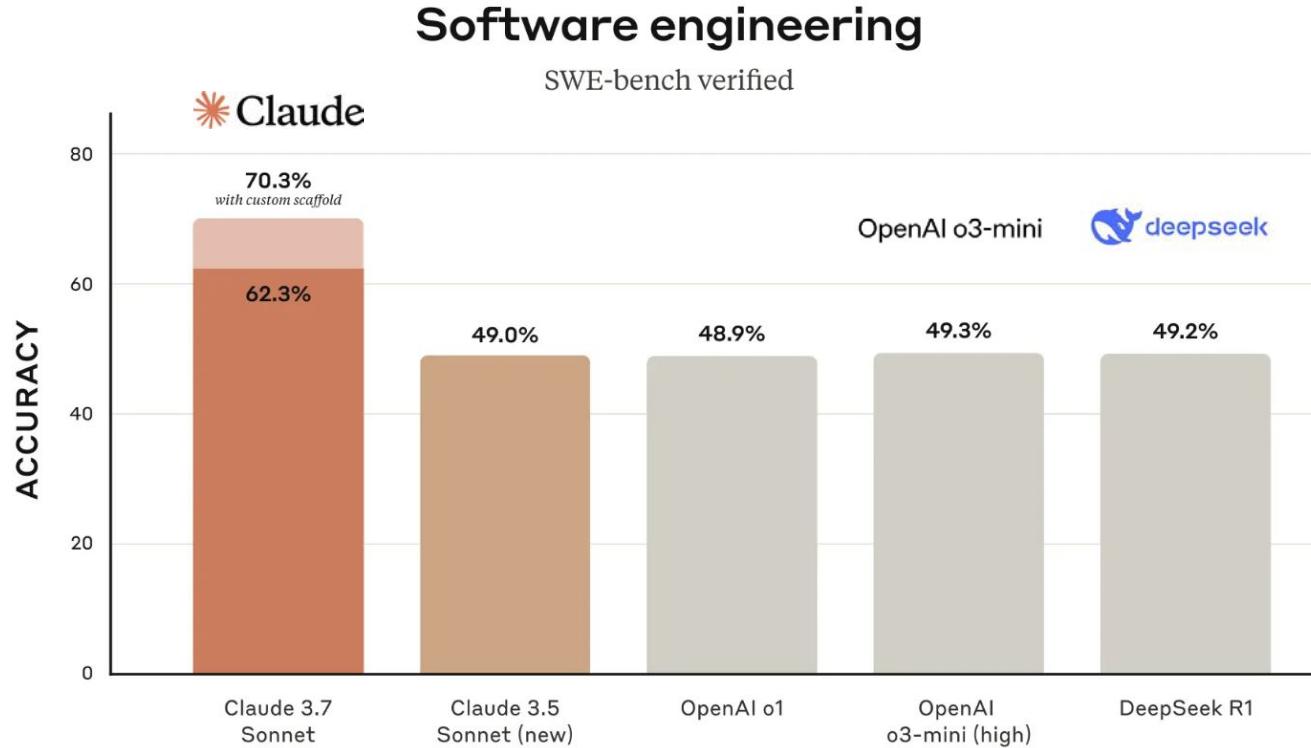
24. Feb. 2025 • 5 min read



ANTHROPIC
Released Claude 3.7
Sonnet
24. Feb. 2025

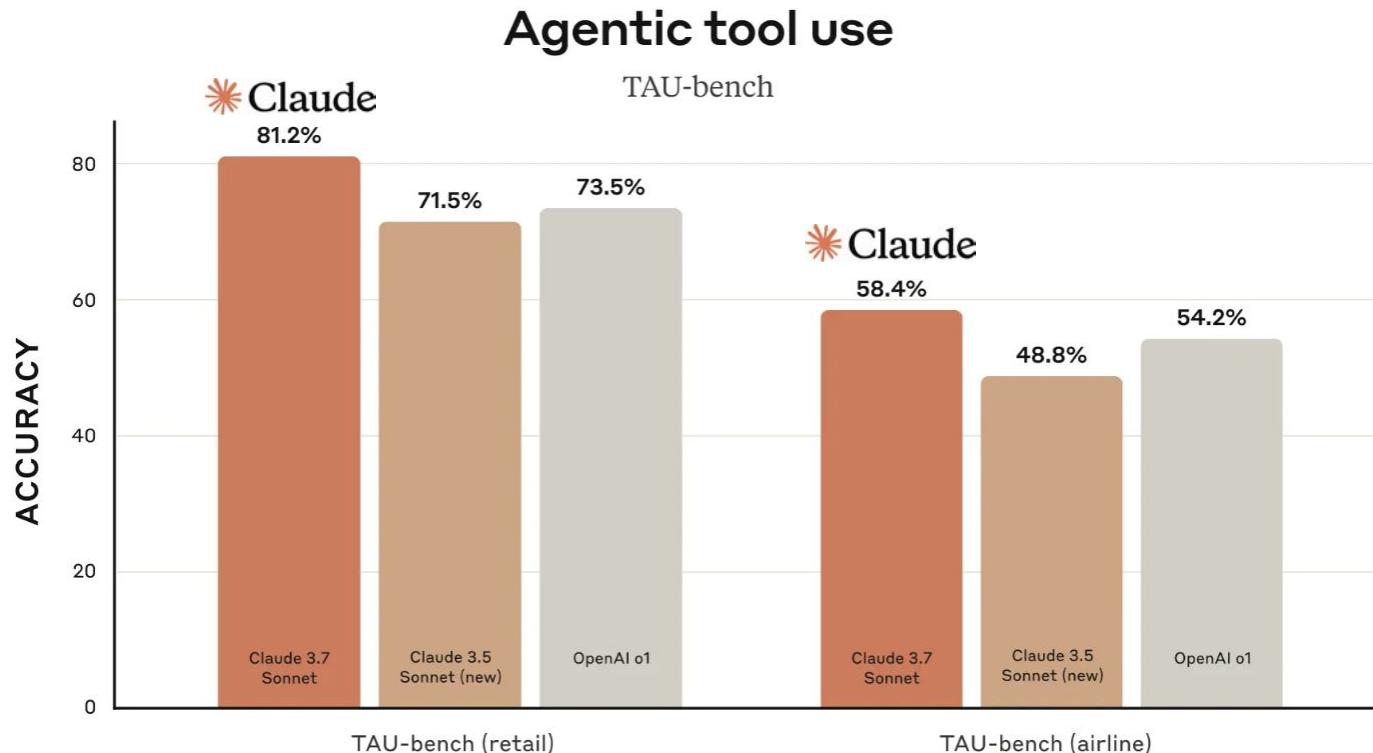
SOFTWARE ENGINEERING

SWE-bench evaluates AI models' ability to solve real-world software issues.
SWE-bench



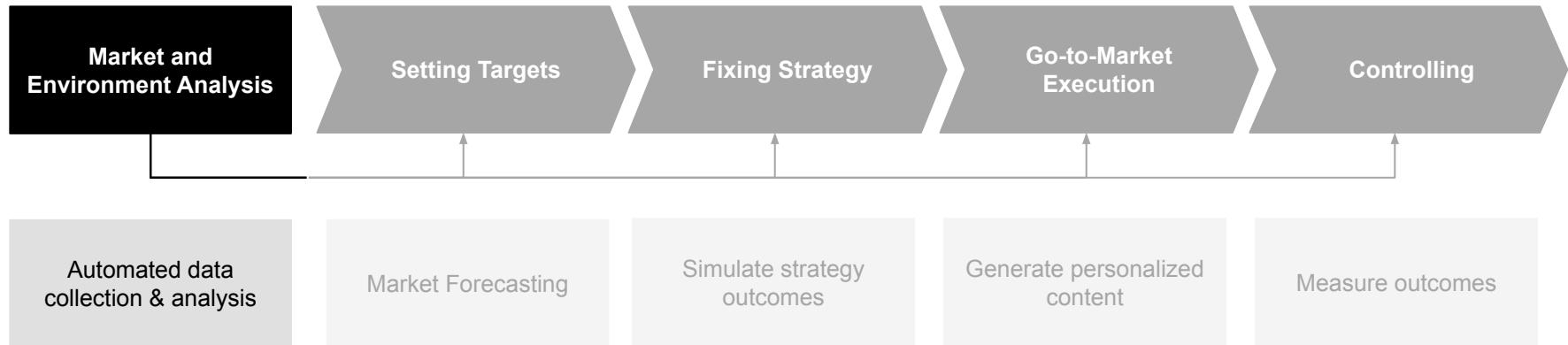
AGENTIC TOOL USE

TAU-bench, a framework that tests AI agents on complex real-world tasks with user and tool interactions.
TAU-bench



03 REAL WORLD MARKETING USE CASES

OPTIMIZE THE MARKETING & SALES PROCESS WITH GENERATIVE AI



EXTRACT CUSTOMER REVIEWS FROM THIS WEBSITE

Web scraping of customer reviews

KÄRCHER

Kärcher Shopping Reviews

 Authentic Business

Reviews

Rating Snapshot

Select a row below to filter reviews.

Rating	Count
5★	2380
4★	311
3★	177
2★	107
1★	272

Average Customer Ratings

Category	Overall Rating
Overall	4.4
Customer Service	4.4

1–10 of 3247 Reviews

Sort by: Most Recent ▾

★★★★★ Greg123 · 9 hours ago

Well designed web page. Easy to compare models. Very pleased with shipping.

I recommend this seller. ✓ Yes

★★★★★ Gen · 2 days ago

Started on the second pull. Quite happy. The order process was very simple. I tried ordering from another source and received the wrong carburetor. Yours was cheaper too,

I recommend this seller. ✓ Yes

★★★★★ none · 2 days ago

Received order as promised. Can't expect more than that

I recommend this seller. ✓ Yes

★★★★★ Dave244 · 8 days ago

Excellent service! I was notified every step of the shipment process and a very accurate window of delivery.

Customer Service



I recommend this seller. ✓ Yes

GENERATE CODE TO SCRAPE THE WEBSITE

We use AI to generate Python code to obtain the data from the website

Input: Prompt



JK You are an expert Python developer, familiar with the latest web scraping modules. Provide me with a Python script to scrape all the content on this live website <https://ratings.bazaarvoice.com/index.html?merchant=kaercher> (all pages). You need to click on a pop up "Cookies akzeptieren" when you load the page. I have provided a static HTML file so you can review the code of the live website. Note that there are multiple pages and you need to click a button at the right lower corner to navigate to the next page. This is the button-element:
` ► `
On the last page, this is at the lower left corner: 3221–3243 of 3243 Reviews.

Output: Code

A screenshot of a code editor window titled "Untitled-1". The code is written in Python and uses BeautifulSoup to parse the HTML from the provided static file. It includes imports for requests,BeautifulSoup, and re, and defines a function to extract reviews from the HTML. A screenshot of the generated Python code is shown.

DATASET WITH OVER 3,240 CUSTOMER REVIEWS

Let's run the code on our machine

Run the Code

A screenshot of a code editor window titled "lab-web scraping". The code is written in Python and uses the BeautifulSoup library to parse HTML. It includes imports for requests,BeautifulSoup, and pandas. The script fetches a URL, parses the HTML, and prints the results. A specific section of the code is highlighted in yellow.

We get a table with customer reviews

	A	B	C	D
1	text		rating	author
2	Very easy to look up and order parts order parts... fast shipping!		5	Ed3000
3	Fast shipping and arrived with no damages. Highly recommend !		5	David
4	Excellent service! I was notified every step of the shipment process and a very accurate w		5	Dave244
5	Prompt shipping and well packed. Had no broken parts		5	Axel
6	Very good shopping experience. Love the new Kärcher		5	BikeMike
7	Easily navigable website and shipment received promptly.		5	DBAune
8	Received order in a timely manner. Product works better than anticipated.		5	Revvie
9	Product arrived quickly. Downside would be response on shipping must be 100 character		5	WEL87
3239	A little slower than normal shipping but that's ok		5	Old Guard
3240	Order arrived on time and great customer service. Would definitely recommend.		5	Robin
3241	I received my order quickly and it was correct. What more could I ask for?!		5	KarenKay
3242	Everything as stated....what more can you ask for!		5	Mikej
3243	Easy to use website. Lots of great products. Fast delivery. Great customer service		5	Gman67
3244	The website is very easy to navigate and user friendly. Got my order a lot faster than I tho		5	Bronson15

GENERATE CODE TO ANALYZE THE REVIEWS

Generate insights from text mining

Input: Prompt and customer review data

A	B	C	D
1 test	rating	author	date
2 Very easy to look up and order parts order parts... fast shipping!	5	E3000	a day ago
3 Fast shipping and arrived with no damages. Highly recommended!	5	David	2 days ago
4 Excellent service! I was notified every step of the return/replacement process and a very accurate w	5	Dave244	2 days ago
5 Product shipped quickly and arrived in good condition	5	Judi	4 days ago
6 Very good shopping experience. Love the new Kärcher	5	BretMike	4 days ago
7 Easily navigable website and shipment received promptly.	5	DBaune	4 days ago
8 Received order in a timely manner. Product works better than anticipated.	5	Reenie	4 days ago
9 Product arrived quickly. Downside would be response on shipping must be 100 character	5	WELET	5 days ago

Analyzing Kärcher Customer Reviews to Improve Products and Marketing ▾

kärcher_review.csv
TEXT/CSV

JK I'm a Kärcher Marketing Manager and I want you to perform text mining, natural language understanding, and sentiment analysis on customer review data I provided you with. Act as a senior data analysis expert, knowledgeable in data storytelling. The results are intended to be used by marketing and product management teams to gain insights into customer satisfaction and complaints. It is your task to provide Python code, explanations, and best practices for processing and analyzing customer review data. Also offer suggestions on how to interpret the results and apply the insights to improve products and marketing strategies. The tone should be casual and approachable, making the interactions easy to understand and engaging.

Output: Code



Claude

First, let's start by importing the necessary libraries and loading the data:

python

```
import pandas as pd
import numpy as np
import matplotlib.pyplot
import seaborn as sns
from nltk.sentiment import
from wordcloud import Wor
from sklearn.feature_exte
import re
```

Load the data

```
df = pd.read_csv('kärcher
# Display the first few r
print(df.head())
print(df.info())
```

Load the data

df = pd.read_csv('kärcher
Display the first few r
print(df.head())
print(df.info())

Calculate basic stat
print("Average rating")
print("Number of reviews")
print("Date range")

Plot rating distri
plt.figure(figsize=(10, 6))
sns.histplot(df['rat
plt.title('Distribution
plt.xlabel('Rating')
plt.ylabel('Count')
plt.show()

Calculate basic stat
print("Average rating")
print("Number of reviews")
print("Date range")

Plot rating distri
plt.figure(figsize=(10, 6))
sns.histplot(df['rat
plt.title('Distribution
plt.xlabel('Rating')
plt.ylabel('Count')
plt.show()

Initialize sentiment analyzer
sia = SentimentIntensityAnalyzer()

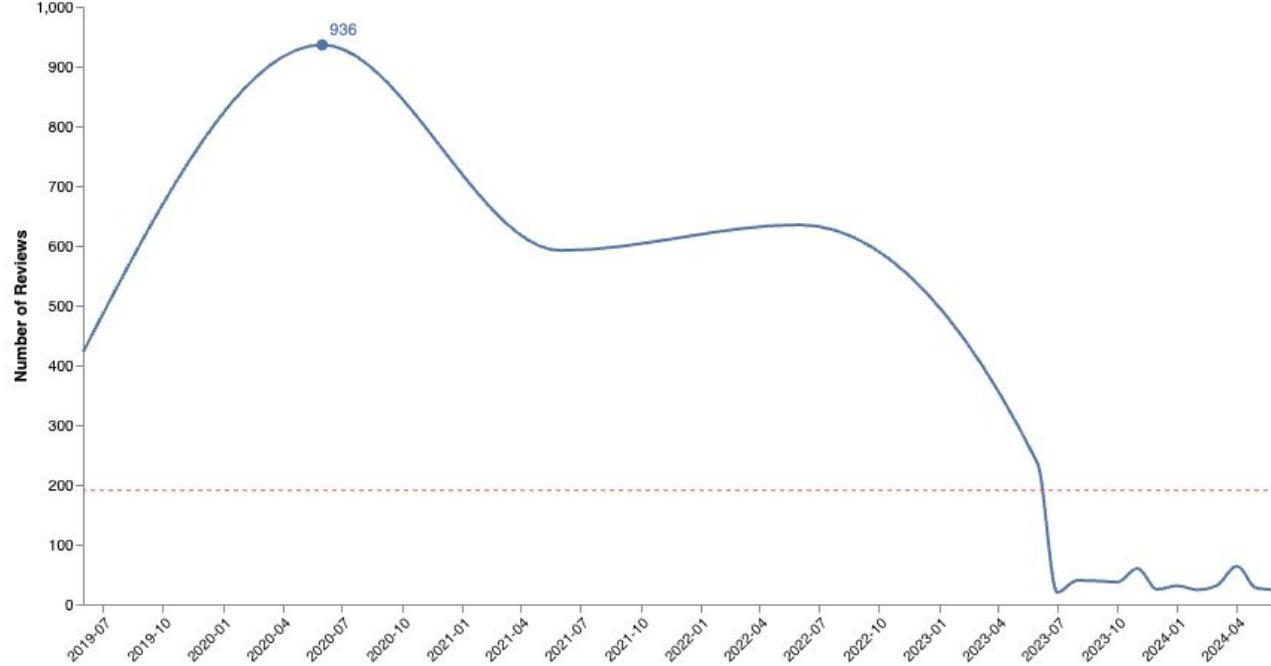
```
# Function to get sentiment scores
def get_sentiment(text):
    return sia.polarity_scores(text)['compound']

# Apply sentiment analysis
df['sentiment'] = df['text'].apply(get_sentiment)

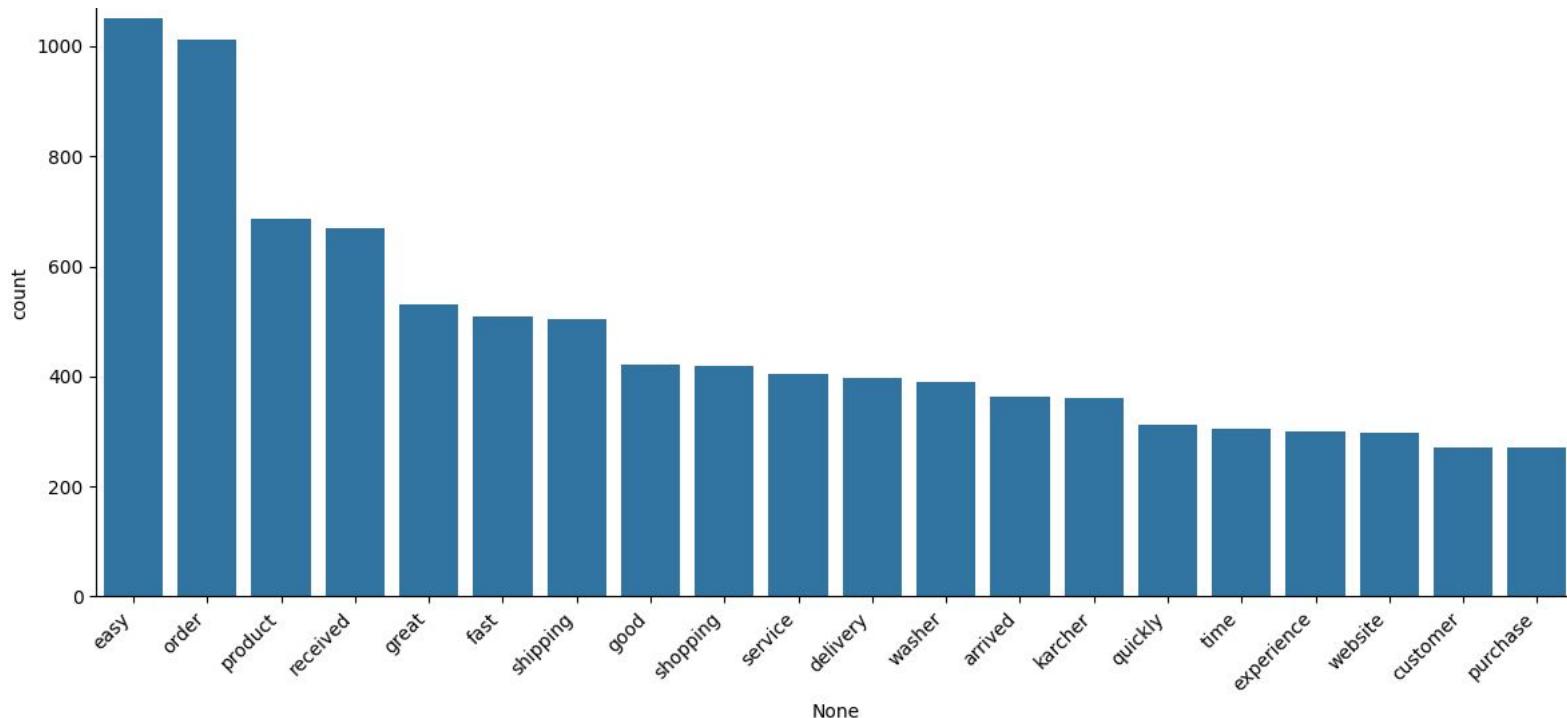
# Plot sentiment vs rating
plt.figure(figsize=(10, 6))
sns.scatterplot(x='rating', y='sentiment', data=df, alpha=0.5)
plt.title('Sentiment Score vs Rating')
plt.xlabel('Rating')
plt.ylabel('Sentiment Score')
plt.show()
```

CUSTOMER REVIEWS OVER TIME

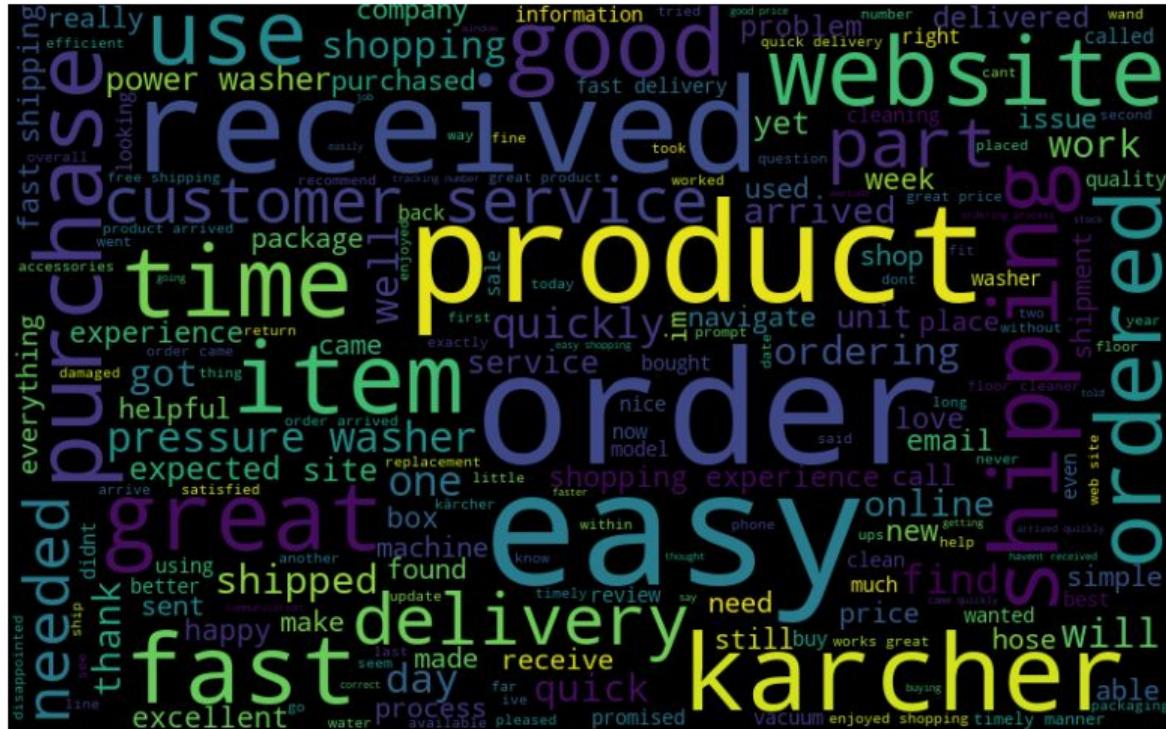
Kärcher Review Volume Peaks in Recent Months
Number of customer reviews per month
Average: 191 reviews per month



TOP 20 MOST COMMON WORDS

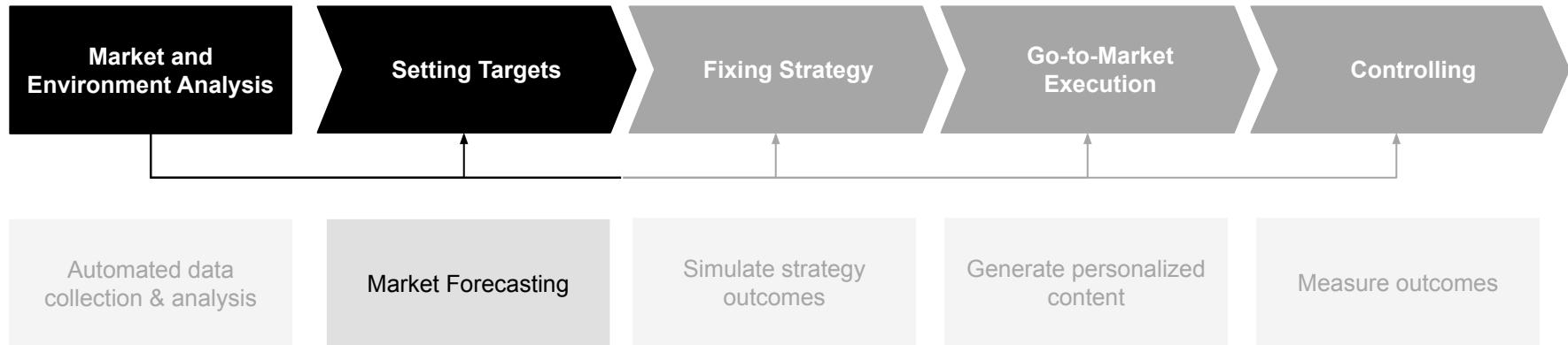


MOST COMMON WORDS AS A WORD CLOUD



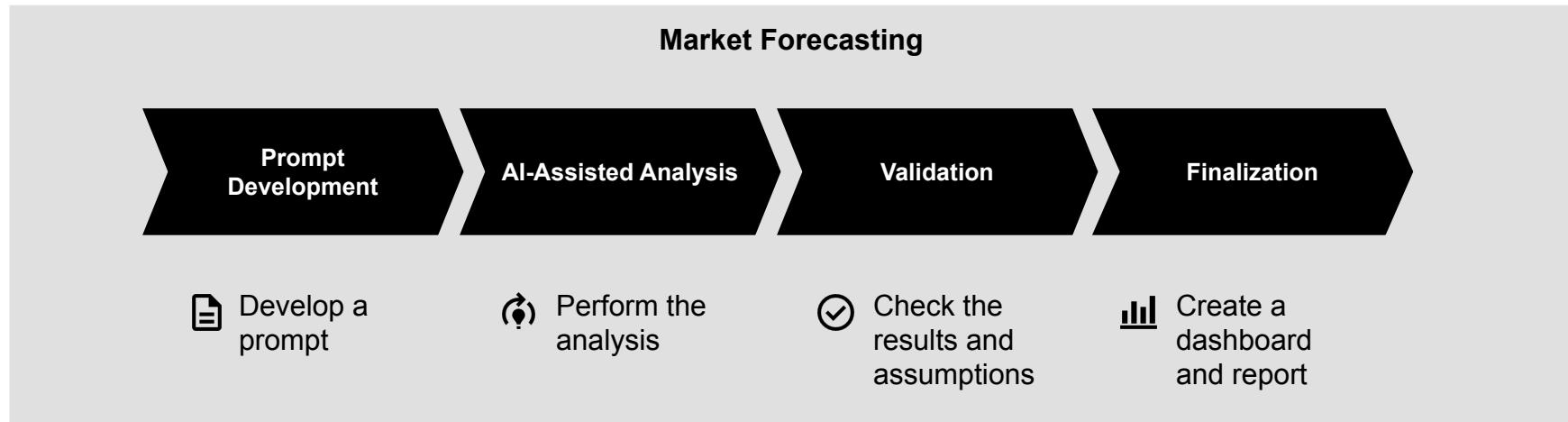
OPTIMIZE THE MARKETING & SALES PROCESS WITH GENERATIVE AI

Internal process overview of five key stages



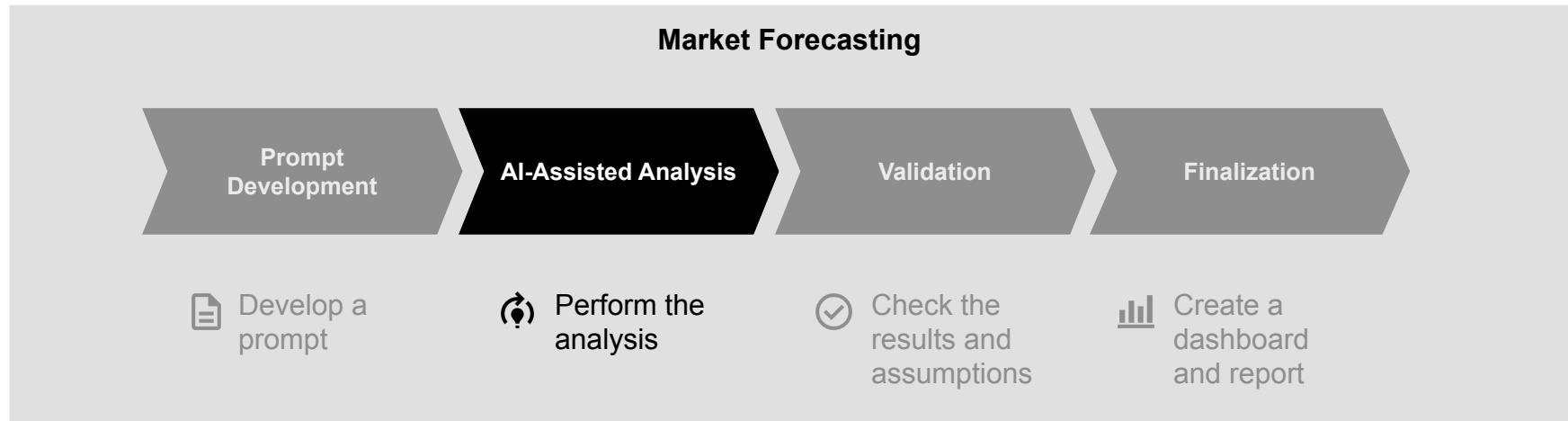
MARKET FORECASTING

Step by step approach to create a market forecast



MARKET FORECASTING

Step by step approach to create a market forecast



Let's develop a market
forecast for Spain for
the year 2025

4. Key Performance Indicators (KPIs)

KPI	2024 Value	2025 Forecast	Change (%)
Revenue	€72.5M	€75.8M	+4.5%
Units Sold	140,000	145,000	+3.6%
Market Share	15%	16%	+1 ppt
Year-over-Year Growth	3.5%	4%	+0.5 ppt

Scenario	Revenue (€M)	% Change
Best-Case	€80.0	+10%
Most Likely	€75.8	+4.5%
Worst-Case	€70.0	-4%

Best-Case Scenario:

- Factors: Strong market demand, successful marketing campaigns, favorable economic conditions.
- Projected Revenue: €80.0M (+10%)

Worst-Case Scenario:

- Factors: Economic slowdown, increased competition, supply chain issues.
- Projected Revenue: €70.0M (-4%)

Most Likely Scenario:

- Factors: Moderate growth aligned with historical trends and market conditions.
- Projected Revenue: €75.8M (+4.5%)

KPIs

2025 projection:
 Units sold: 145 K
 Market share: 16%

Scenario analysis with
 best-case,
 most likely and
 worst-case

9. Data Sources and Assumptions

- **Data Sources:** Kärcher Spain sales records, industry reports, economic data from national statistics agencies.
- **Assumptions:** Stable economic conditions, continuation of current consumer trends, no significant market shifts.

10. Executive Summary

Key Findings:

- Steady historical growth.
- Projected revenue of €75.8M for 2025.
- Strong growth in Pressure Washers and stable growth across other categories.
- North and South regions leading in sales performance.

This detailed analysis and forecast will help Kärcher Spain strategically plan and achieve its sales targets for 2025. For further details, you can refer to Kärcher's annual reviews and market reports available on their official website ([Kärcher](#)) ([Kärcher](#)) ([Kärcher](#)).

Data sources

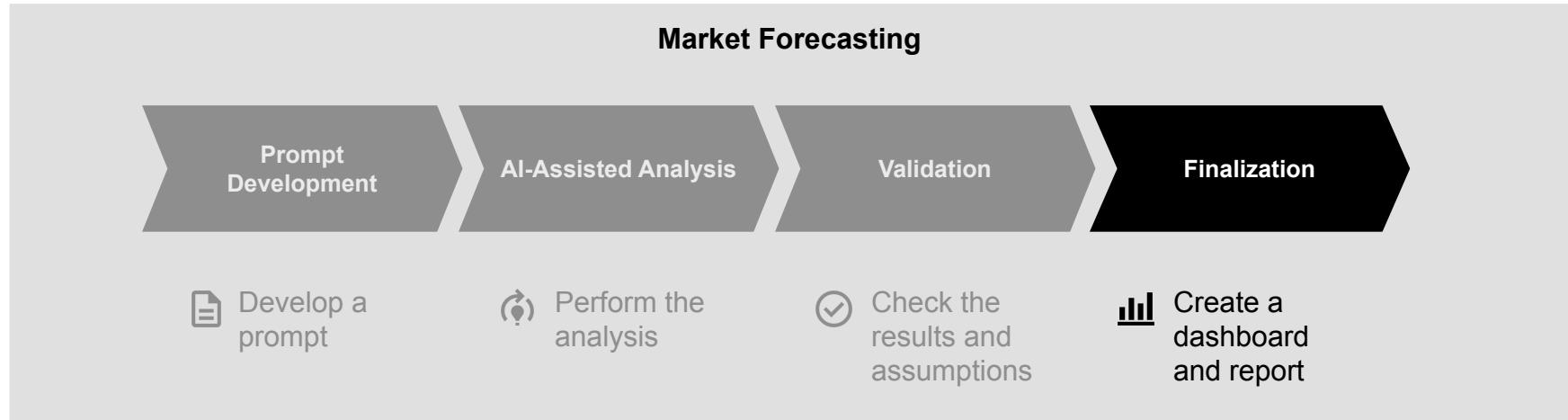
Overview of data sources and assumptions

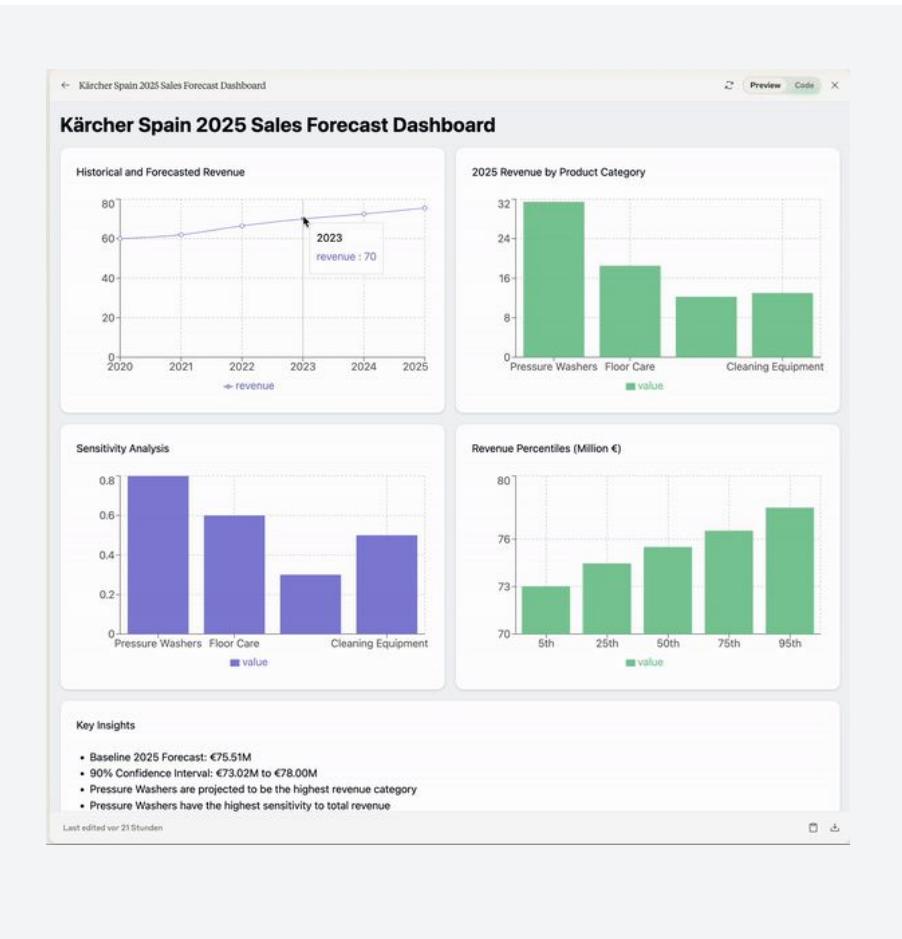
Executive summary

Stable growth across all products

MARKET FORECASTING

Step by step approach to create a market forecast





Forecast dashboard

Dashboard with
different KPIs

SALES MARKET FORECAST REPORT FOR SPAIN

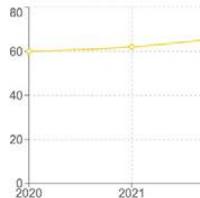


KÄRCHER SPAIN
2025 Sales Forecast Report

EXECUTIVE SUMMARY

As we look ahead to 2025, Kärcher Spain projects a total revenue of €75.51M, representing our commitment to innovation, customer categories.

HISTORICAL AND FORECASTED REVENUE



2025 REVENUE FORECAST BY PRODUCT CATEGORY



KEY INSIGHTS

- **Baseline 2025 Forecast:** €75.51M
- **90% Confidence Interval:** €73.02M to €78.00M
- **Pressure Washers:** Continue to be our primary revenue driver.
- **Cleaning Equipment:** Shows promising growth potential.

STRATEGIC RECOMMENDATIONS

- Invest in Pressure Washers:** As our top-performing category, we should focus on innovation and marketing to maintain our market leadership.
- Boost Cleaning Equipment:** Capitalize on the growth trend by expanding our product range and targeting new market segments.
- Enhance Digital Presence:** Improve our e-commerce platform and increase digital marketing efforts to capture a larger online market share.
- Expand B2B Partnerships:** Develop tailored solutions for commercial and industrial clients to drive growth in these sectors.
- Implement Customer Loyalty Program:** Foster repeat business and gather valuable customer insights through a comprehensive loyalty scheme.

CONCLUSION

The 2025 forecast presents a positive outlook for Kärcher Spain, with opportunities for growth across all product categories. By focusing on our strengths, particularly in the Pressure Washer segment, while also nurturing emerging categories like Cleaning Equipment, we are well-positioned to exceed our targets. Our commitment to innovation, sustainability, and customer satisfaction will continue to drive our success in the Spanish market.

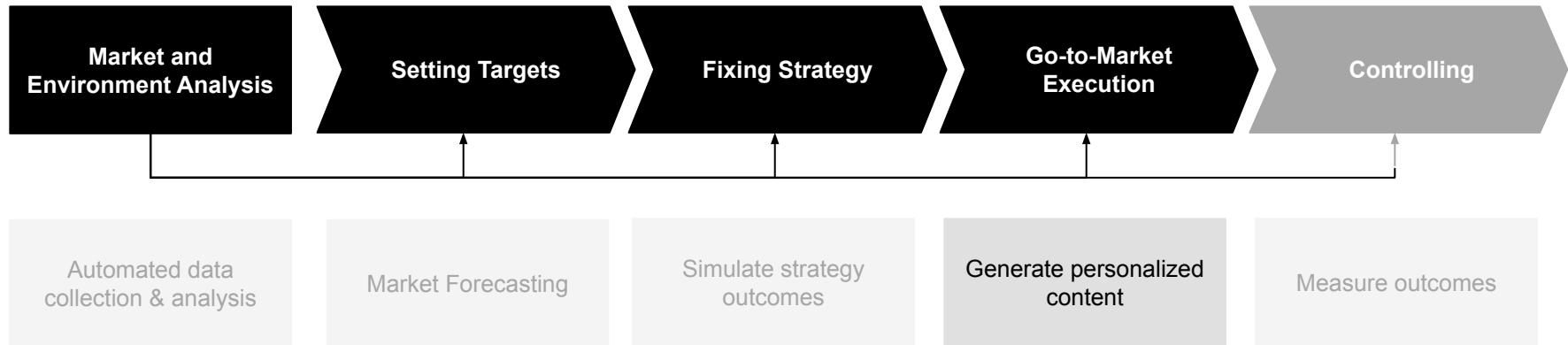
Note: This report is based on comprehensive market analysis and Monte Carlo simulations. For detailed methodology or questions, please contact the Strategy Department.



synthesia

OPTIMIZE THE MARKETING & SALES PROCESS WITH GENERATIVE AI

Internal process overview of five key stages



AUTOMATED SALES SOLUTION WITH TWO AI AGENTS

An agent is an entity that can act on behalf of human intent.



AGENT 1: SALES AGENT

- 1) Find top leads
- 2) Create company profiles

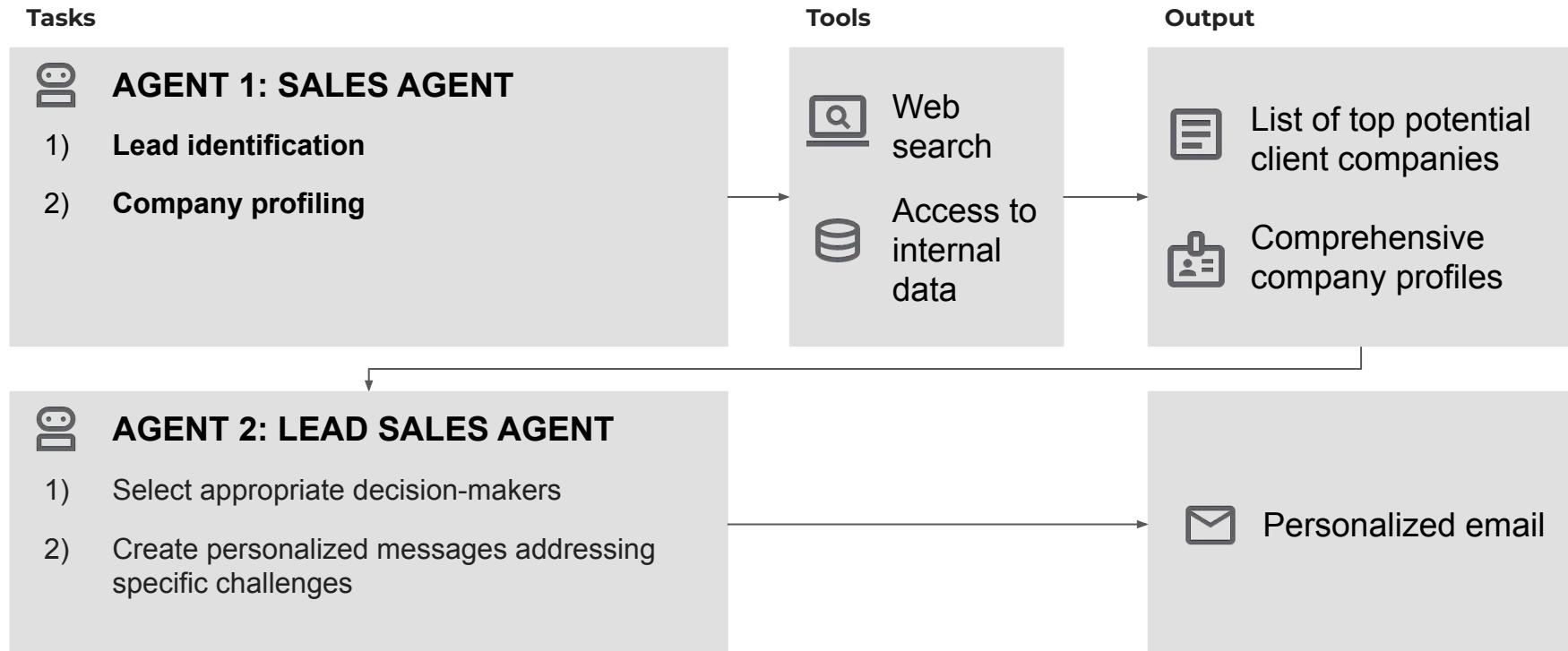


AGENT 2: LEAD SALES AGENT

- 1) Select appropriate decision-makers
- 2) Create personalized messages

PERSONALIZED OUTREACH CAMPAIGN WITH TWO AI AGENTS

Overview of agentic solution



User interface to start
the process

Kärcher Custom Outreach Agents

Select target groups, enter location, and specify number of leads to start the outreach process

Target Groups

- Agriculture
- Construction
- Offices
- Industry
- Public Services
- Reca
- BSC
- Automotive
- Transport
- Health Care
- Retail
- Hospitality

Location

e.g. Spain

Number of Leads

e.g. 100

Start Custom Outreach

User interface of the application

Kärcher Agentic Outreach Dashboard

Agent 1: Sales Agent

Status: Waiting

[Start Custom Outreach](#)

Agent 2: Lead Sales Agent

Status: Waiting

[Stop Custom Outreach](#)

Generated Outputs

List of Top Potential Client Companies

[Download List](#)

Comprehensive Company Profiles

[Download Profiles](#)

Personalized Emails

[Download Emails](#)

Agent Logs

AGENT OUTPUTS COMPANY PROFILES

Comprehensive company profiles about Meliá Hotels International and Barceló Hotel Group

Comprehensive Report for Meliá Hotels International and Barceló Hotel Group

Meliá Hotels International

1. Detailed Company Profile and Recent Developments:

- Company Profile: Meliá Hotels is a global hospitality group with various brands such as Sol Hotels, Iberostar, and Meliá. It is one of the largest operators of holiday resorts and spas worldwide.
- Recent Developments:
 - Meliá has focused on debt reduction and cost optimization.
 - The company has expanded its presence in emerging markets.
 - Meliá has emphasized sustainability and environmental responsibility.

2. Specific Cleaning Challenges in Their Hospitality Operations:

- Meliá's diverse portfolio, including luxury, premium, and mid-scale properties.
- Managing cleanliness across numerous properties and brands.
- Addressing sustainability in cleaning operations.

3. Current Cleaning Processes and Potential Pain Points:

- Use of traditional cleaning methods.
- High turnover in cleaning staff.
- The need for specialized cleaning equipment.

4. Sustainability Goals and How They Relate to Cleaning Practices:

- Meliá is committed to reducing its carbon footprint.
- The company aims to use eco-friendly cleaning products.

5. Regulatory Requirements in Spain:

- Compliance with Spain's stringent environmental regulations.
- Adherence to environmental regulations.

6. Identify Key Decision-Makers:

- Gabriel Escarrer Jaume, Executive Chairman.
- André Gerondaud, Chief Operating Officer.
- Mark Hodinott, Chief Real Estate Officer.

7. Potential Areas Where Kärcher's Solutions Can Provide Significant Value:

- Introduction of advanced floor cleaning technologies.
- Utilization of eco-friendly cleaning products.
- Implementation of automated cleaning systems.

8. Suggested Kärcher Products and Services:

- Kärcher B 300 R I for large floor cleaning.
- Kärcher T 9/1 Bp cordless vacuum cleaner.
- Kärcher's range of eco-friendly cleaning products.

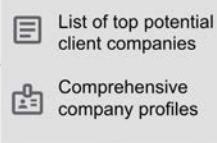
Tasks

Tools

Output

AGENT 1: SALES AGENT

- 1) Lead identification: Analyze companies and consider recent growth and initiatives.
- 2) Company profiling: Deep dive into company-specific challenges and mapping of solutions to company needs.



AGENT 2: LEAD SALES AGENT

- 1) Select appropriate decision-makers.
- 2) Craft tailored messages addressing specific challenges.



AGENT 2 FINISHED THE TASK

Personalized emails for the two decision makers of the hotel groups.

Outreach Campaign for Meliá Hotels International

Name and Title of Key Decision-Maker:
• Gabriel Escarrer Jaume, Executive Vice President and CEO

Personalized Email Draft:

Subject: Enhance Sustainability and
Değerli Mr. Escarrer Jaume,

I hope this message finds you well. C
recognition by industry leaders.

At Kärcher, we understand that main
Managing consistency and efficiency
Meliá's high standards and sustaina

To address these challenges, Kärcher
ideal for large floor areas in resorts,
cleaner offers unparalleled convenience
sustainability initiatives by reducing

A recent case study with Marriott Int
chemical usage, aligning perfectly w

I would love to arrange a product de
Could we schedule a consultation ne

Thank you for considering Kärcher a

Best regards,

[Your Name]
Lead Sales Representative – Hospitality
[Your Contact Information]

Suggestion for Follow-Up Strategy:
• Follow up one week after the initial
• Send a reminder email three days
• After the demonstration, send a d

A recent collaboration with Hilton Hotels resulted in a 25% reduction in cleaning time and a significant decrease in water and chemical consumption, underscoring the efficiency and sustainability of our solutions.

I would be delighted to arrange a consultation to discuss how Kärcher can help Barceló achieve superior cleaning performance and sustainability. Could we schedule a meeting next week to explore these opportunities?

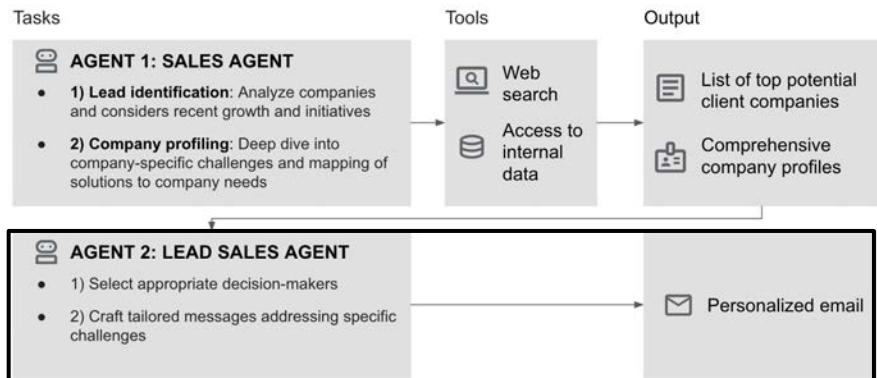
Thank you for considering Kärcher as a partner in your journey towards operational excellence and sustainability.

Best regards,

[Your Name]
Lead Sales Representative – Hospitality, Kärcher Spain
[Your Contact Information]

Suggestion for Follow-Up Strategy:
• Follow up one week after the initial email with a phone call to discuss any questions and confirm the meeting.
• Send a reminder email three days before the scheduled consultation.
• After the meeting, send a detailed proposal highlighting the discussed solutions and next steps.

By adopting Kärcher's advanced and sustainable cleaning technologies, both Meliá Hotels International and Barceló Hotel Group can enhance their operational efficiency, maintain high hygiene standards, and achieve their sustainability goals.



Personalized Email Draft:

Subject: Transform Barceló's Cleaning Efficiency with Kärcher's Sustainable Solutions

Dear Mr. González,

Congratulations on Barceló Hotel Group's accolade as the "Best Hotel Management Company in the World" at the World Travel Awards 2023. Such recognition is a testament to your commitment to excellence and innovation.

In the pursuit of maintaining Barceló's high cleanliness standards across your global portfolio, Kärcher is here to offer cutting-edge cleaning solutions tailored to your needs. We recognize the challenges of managing consistent cleaning standards and high labor costs, especially with manual cleaning processes.

Our Puzzi 10/1 is perfect for carpet and upholstery cleaning in guest rooms and lounges, ensuring deep cleaning and quick drying times. For enhanced hygiene, our SGV 8/5 steam vacuum cleaner provides thorough sanitization, meeting the stringent health and safety regulations in Spain. Additionally, our eco!efficiency range of cleaning agents supports Barceló's sustainability initiatives by minimizing environmental impact.

A recent collaboration with Hilton Hotels resulted in a 25% reduction in cleaning time and a significant decrease in water and chemical consumption, underscoring the efficiency and sustainability of our solutions.

I would be delighted to arrange a consultation to discuss how Kärcher can help Barceló achieve superior cleaning performance and sustainability. Could we schedule a meeting next week to explore these opportunities?

Thank you for considering Kärcher as a partner in your journey towards operational excellence and sustainability.

Best regards,

[Your Name]

Lead Sales Representative – Hospitality, Kärcher Spain

[Your Contact Information]

Personalized introduction

Mentions specific products
(Puzzi 10/1, SGV 8/5)

Cites case study with Hilton

Call to action (meeting)

DECISION MAKER FOR BARCELÓ HOTEL GROUP

Agent 2 selects the appropriate decision maker of Barceló Hotel Group

Outreach Campaign for Barceló Hotel Group

Name and Title of Key Decision-Maker:

- Raúl González, CEO for EMEA



Raúl González · 3.

Chief Executive Officer EMEA at Barceló Group

Metropolregion Palma de Mallorca · [Kontaktinfo](#)

20.311 Follower:innen · 500+ Kontakte

Barceló Barceló Hotel Group



IESE Business School

+ Folgen

• Vernetzen

Mehr

Total duration

2 minutes

Kärcher Agentic Outreach Dashboard

Agent 1: Sales Agent

Status: Waiting

[Start Custom Outreach](#)

[Stop Custom Outreach](#)

Agent 2: Lead Sales Agent

Status: Waiting

Generated Outputs

List of Top Potential Client Companies

[Download List](#)

Comprehensive Company Profiles

[Download Profiles](#)

Personalized Emails

[Download Emails](#)

Agent Logs

[Redacted Content]

04

HOW TO BUILD YOUR OWN AI-POWERED MARKETING SOLUTION

CONTENT CREATION

 Replay

The AI Inflection Point for Marketing: 2025 trends, predictions, and how to prepare →

The AI your marketing deserves

Elevate your team, your brand, and your impact
with AI that's built for marketing.

[Start Free Trial](#)[Get A Demo](#)



[←](#) **Blog Post** 

Engaging long-form content aimed at providing value, driving traffic, and enhancing SEO

Voice: [Jasper](#) Language: [English \(American\)](#)

Blog Topic

How to Do Demand Generation for B2B SaaS

40/100

Audience

startup founders

16/100

Keywords

demand generation

17/100

Empower this template with your voice and facts about your brand with Jasper Brand Voice. [Get Started](#)

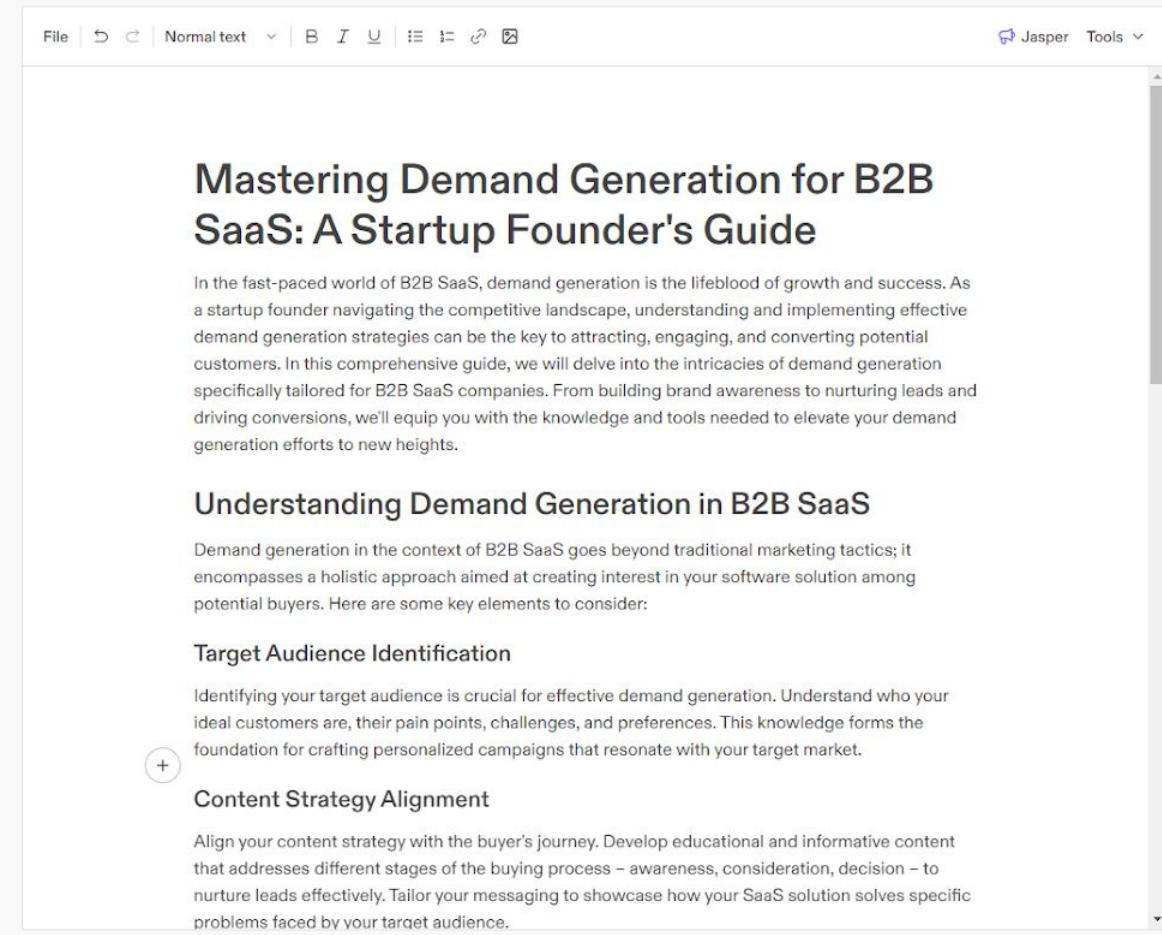
Background information

Any additional information or points to cover

0/2000

[Clear inputs](#)

[Generate content →](#)



Get the AI built for better marketing results

Creator

\$49 month/
seat

Powerful AI features to create & improve your content everywhere you work online.

[Start Free 7-Day Trial](#)

Plan includes:

- ✓ 1 user seat
- ✓ 1 Brand Voice
- ✓ Access to Jasper Chat
- ✓ Access to SEO mode
- ✓ Use AI everywhere with browser extension

Pro

\$69 month/
seat

Advanced AI features to create content for multiple brands & collaborate on campaigns.

[Start Free 7-Day Trial](#)

Everything in Creator, plus:

- ✓ Includes 1 seat, add up to 5
- ✓ 3 Brand Voices
- ✓ 10 Knowledge assets
- ✓ 3 Instant Campaigns
- ✓ Collaboration & user management
- ✓ AI image generation & editing tools

Business

 Custom pricing

Personalized AI features with additional control, security, team training & tech support.

[Contact Sales](#)

Everything in Pro, plus:

- ✓ Unlimited feature usage
- ✓ Custom Workflows and Apps*
- ✓ Groups & document collaboration
- ✓ Custom Style Guides with X-ray view
- ✓ Enterprise-grade security & governance
- ✓ Advanced admin panel with permissions
- ✓ API access*
- ✓ Dedicated account management team with premium support

OPEN SOURCE SOLUTION



Visual Studio Code

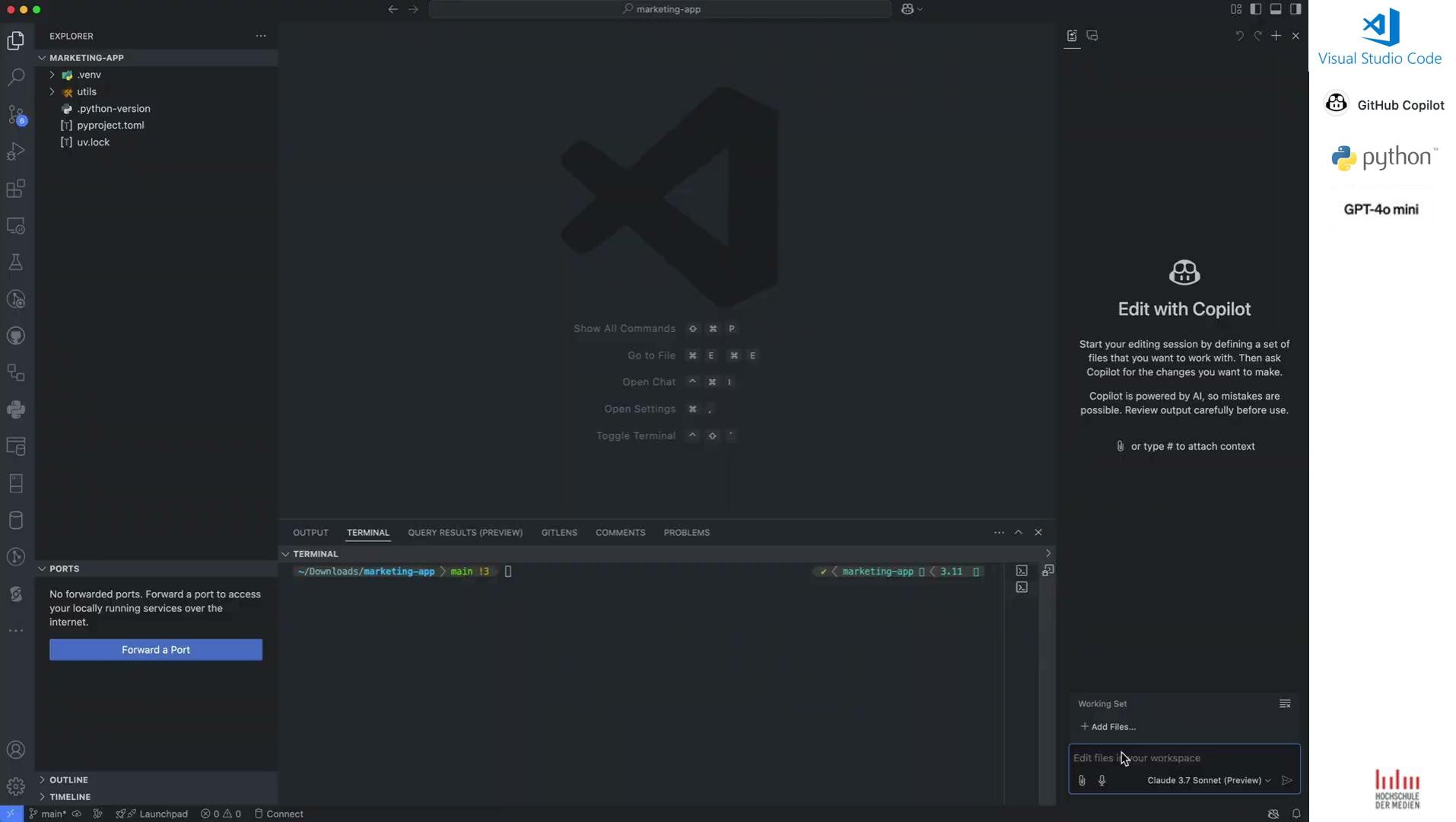


python TM

GPT-4o mini



GitHub Copilot



The screenshot shows a Visual Studio Code interface with several floating windows and panels.

Top Bar: The title bar shows "marketing-app". The status bar at the bottom indicates "You, 8 seconds ago" and "Not Committed Yet".

Left Sidebar: The "EXPLORER" view shows a file tree for a project named "MARKETING-APP". The "app.py" file is open in the main editor. Other files listed include __pycache__, .venv, utils, .python-version, app.py, config.py, pyproject.toml, README.md, requirements.txt, and uv.lock.

Main Editor: The code editor displays Python code for a Streamlit application. The code includes imports for streamlit, OpenAI, and config, initializes an OpenAI client, sets page configuration, and defines an app header. It also includes a sidebar with tools (Content Generator, Social Media Posts, Email Campaigns, Ad Copy, SEO Suggestions) and a main content area based on the selected tool (Content Generator).

Bottom Left: The "PORTS" section shows "No forwarded ports. Forward a port to access your locally running services over the internet." A blue button labeled "Forward a Port" is present.

Bottom Center: The "TERMINAL" tab is active, showing the command `streamlit run app.py` and its output: "You can now view your Streamlit app in your browser. Local URL: http://localhost:8501 Network URL: http://10.248.148.96:8501 For better performance, install the Watchdog module: \$ xcode-select --install \$ pip install watchdog".

Right Side:

- Github Copilot:** A window titled "Edit with Copilot" with the sub-instruction "Start your editing session by defining a set of files that you want to work with. Then ask Copilot for the changes you want to make." It also states "Copilot is powered by AI, so mistakes are possible. Review output carefully before use." A placeholder text "or type # to attach context" is shown.
- Working Set:** A panel titled "Working Set (1 file)" showing "app.py Open Editor". It includes buttons for "+ Add Files...", ".env.example", and ".gitignore". A tooltip "Edit files in your workspace" points to the "Open Editor" button.
- Bottom Right:** A logo for "HOCHSCHULE DER MEDIEN" and "CLAUDE 3.7 Sonnet (Preview)".



Hello, UTCC Community!

Experience a modern way to order food with 'Acme'! 🚀 No matter what you're craving, we've got trendy options delivered straight to your door—fast, hassle-free, and no waiting in line!

✨ Why choose 'Acme'?

- Convenience: Order easily through the app, anytime, anywhere!
- Wide variety of food: Handpicked favorites from top restaurants in the heart of Bangkok.
- Exclusive student deals: Special discounts and offers just for UTCC students!

Satisfy your hunger and de-stress like a student—just a few clicks, and your meal will be on its way to your office or dorm!

👉 Download the app today and don't miss out on our amazing deals!

VIDEO CREATION

← Home

Sora Overview

Features

Pricing

Help center ↗

Sora log in ↗





Prompt: Create a video for this post: 🍔👋 Hello, UTCC Community! Experience a modern way to order food with ...





Fancy Double Bacon
Cheeseburger

Mangga Pochero
Bacon, pepper + vinegar

Select Day

Order

Download Now

MUSIC CREATION

Create a beach house song about quitting your job

Start with a simple prompt or dive into our pro editing tools, your next track is just a step away.

* Type any idea you have

>Create

Home
Create
Library
Explore
Search

Song description Instrumental

High-energy electronic beat with a modern, urban feel. Catchy synth melodies, punchy bass, and dynamic drum patterns. Fun and uplifting, perfect for a food delivery ad targeting students.

ReMi lyrics model 188 / 200

Workspace

My Workspace

Create

Need ideas?

Invite Friends

40 Credits

Subscribe

What's New? 20

Notifications

Finish your Profile
Add your name and user name to complete your profile!

More from Suno

GiddyUkulelePunk043 | 00:38 / 02:43

My Workspace

Filters (1)

Liked

Search song titles and styles



Acme hyperpop, electronic, experimental
2:43

Extend Public



Acme hyperpop, electronic, experimental
2:49

Extend Public



AI Revolution hip hop gritty confident
2:12

Extend Public



AI Revolution hip hop gritty confident
1:51

Extend Public



Books and Beats country emotional ambiance electronic infusion
3:04

Extend Public



Books and Beats country emotional ambiance electronic infusion
2:53

Extend Public



Tech World Rise steady beat ambient electronic
4:00

Extend Public



Tech World Rise steady beat ambient electronic
1:58

Extend Public



Future Together electronic smooth moderate tempo
4:00

Extend Public



Future Together electronic smooth moderate tempo
4:00

Extend Public



Rise to Innovation

Extend Public



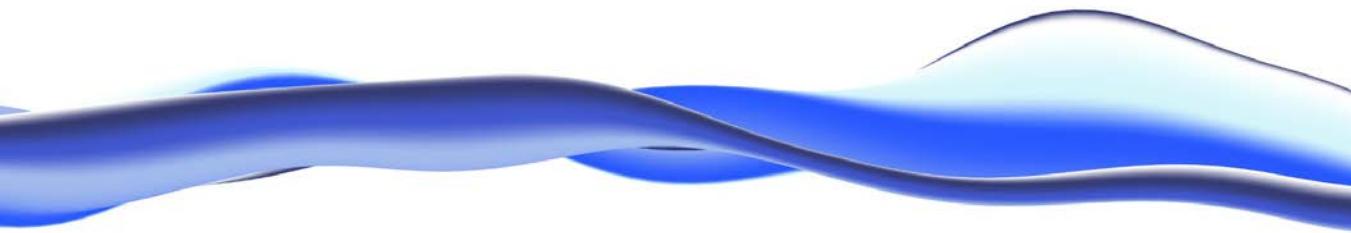
Extend Public

VOICE CREATION

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TEXT TO SPEECH SPEECH TO TEXT VOICE CHANGER DUBBING TEXT TO SFX VOICE CLONING

The ElevenLabs voice generator can deliver high-quality, human-like speech in 32 languages. Perfect for audiobooks, video voiceovers, commercials, and more.

> TELL A STORY INTRODUCE A PODCAST CREATE A VIDEO VOICEOVER

BRIAN

156/500



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Download the app today and don't miss out on our amazing deals!



9,344 credits remaining

655 / 5,000 characters



Regenerate speech

[Audio Tools](#)[Notifications](#)[My Account](#)
My Workspace

Hello, UTCC Community! Experience a modern way to order...

Rachel · Created jetzt

0:00



05 CONCLUSION

THE VALUE OF GENERATIVE AI IN BUSINESS:

- BOOST EFFICIENCY
- ALLOWS PEOPLE TO
REALLOCATE THEIR EFFORT
FROM TASKS IT CAN AUTOMATE

GENERATIVE AI IS EXPECTED TO AUTOMATE 60-70% OF EXISTING EMPLOYEE TASKS

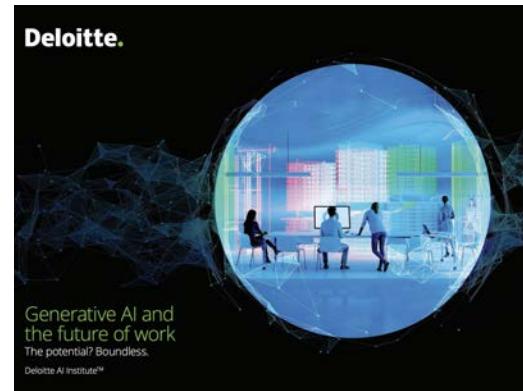
The economic potential of generative AI

The next productivity frontier

June 2023

Source:[McKinsey \(2023\). The economic potential of generative AI: The next productivity frontier.](#)

GEN AI IS NOT REPLACING JOBS;
RATHER IT'S CHANGING THE **TASKS**
AND **SKILLS** WE USE
TO GET THE WORK DONE



Source: [Deloitte AI Institute \(2023\). Generative AI and the future of work](#)

AUTOMATION IMPACT FOR DIFFERENT TYPES OF COGNITIVE TASKS



Source: Based on [Deloitte AI Institute \(2023\). Generative AI and the future of work](#)

THANK YOU!