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# WisdomTree Europe

## The AI Revolution Is Here – And It Goes Much Further Than ChatGPT

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# The AI revolution is here – and it goes much further than ChatGPT

28<sup>th</sup> April 2023

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Associate Director, Quantitative Research



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## **Artificial Intelligence**

The megatrend that stands to impact every industry

# What is Artificial Intelligence (AI)?

## WisdomTree definition



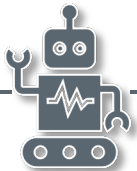
**AI is an algorithm**

AI uses computers and software to absorb, process, and output data.



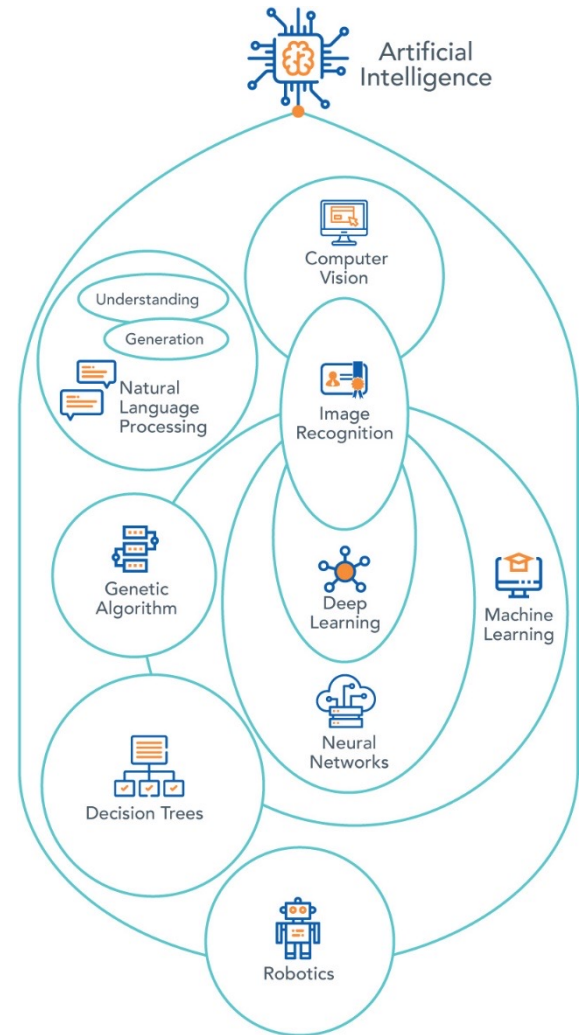
**AI 'learns'**

Using the result of past experiences, AI is able to infer relationships and make predictions without being explicitly programmed to control every possible scenario.



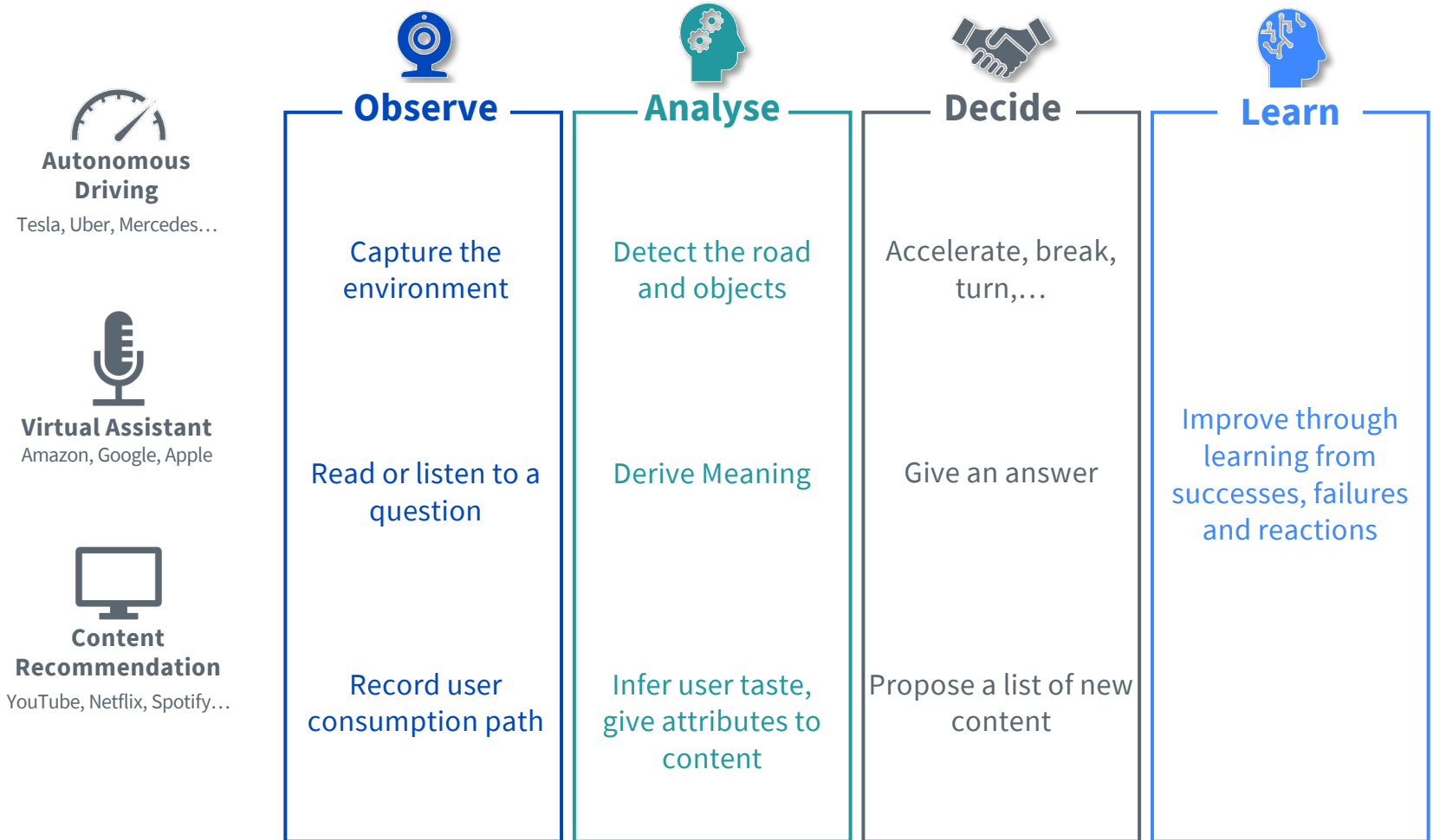
**AI automates**

As AI learns, it adapts. It offers the potential for near-complete elimination of the need for human involvement in complex processes, opening new doors for automation in virtually all industries.



Source: WisdomTree.

# Examples of AI applications



Source: WisdomTree.

# AI significantly lowers the cost of a first-order input – prediction

**Professor Ajay Agrawal, April 2018**

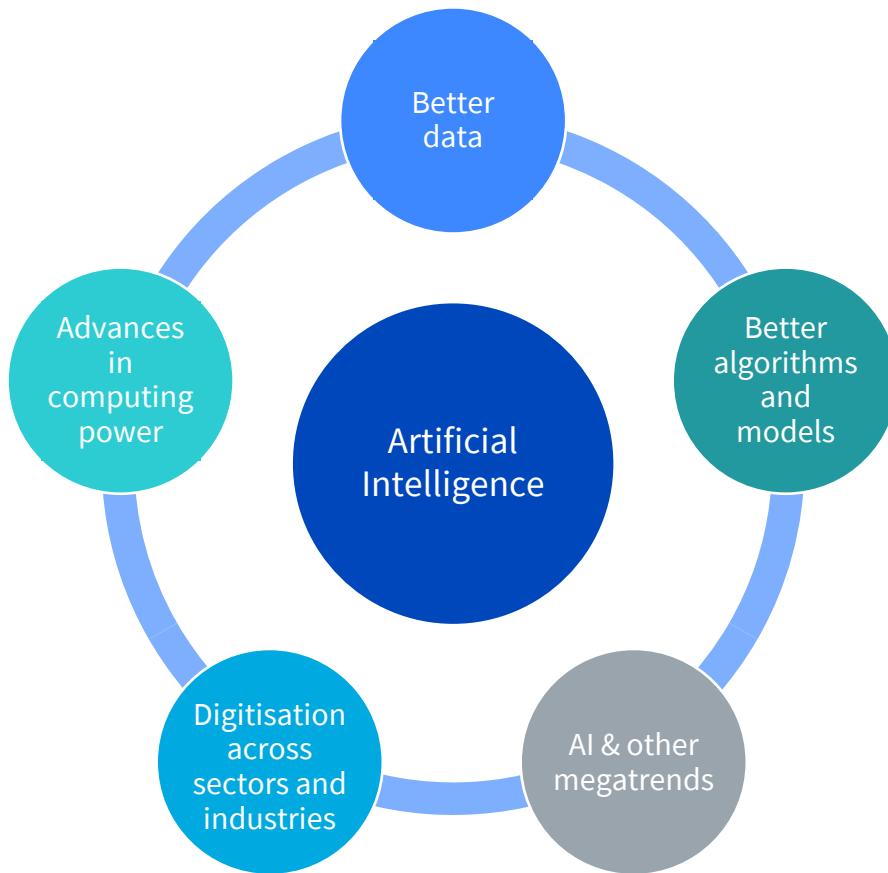
“AI can be recast as causing a drop in the cost of first-order input into many activities in business and our lives — prediction.”

<b>Consequences of lowering the cost of an input</b>	<b>Semiconductors lower the cost of arithmetic</b>	<b>Intelligent machines lower the cost of prediction</b>
Improves performance where the input is already being used	+ E.g. government and military applications	+ Inventory management + Sales and marketing
Permeates applications that have not used the input before	+ Digital photos and then cameras + Marketing & sales, supply chain management etc.	+ Autonomous cars + Virtual assistants + Image recognition
Value of complements goes up	+ Software + Knowledge-rich labour	+ “Data is the new oil” + Human judgement and action
Value of substitutes goes down	+ Mechanical processes + Chemical processes (e.g., photos)	+ Human prediction + “If-then” software

Source: WisdomTree, McKinsey Quarterly “The economics of Artificial Intelligence” published 24<sup>th</sup> April 2018.



# Key factors driving AI adoption and expanding its uses cases to new areas



- Business services
- Healthcare
- Autonomous vehicles
- Industrial automation
- Space Exploration
- E-commerce
- Banking/Finance
- Agriculture
- Construction
- Arts & Entertainment
- Education

Source: WisdomTree.



**Surging popularity of ChatGPT, generative AI  
and the potential for AI proliferation**

Generative AI can impact the speed of innovations in the AI space and can accelerate AI adoption across many industries

ChatGPT is growing its user base at breakneck speed (Months until 100M users)



2

9

30

41

55

70

Source: UBS/Yahoo Finance, dailyinvestor.com. **Logos** from left to right – ChatGPT, TikTok, Instagram, Pinterest, Spotify, Uber. Any trading symbols, entities or investment products displayed are for illustrative purposes only and are not intended to portray recommendations.

# The release of ChatGPT spurred a wave of new releases and generative AI applications

**Jensen Huang, Nvidia CEO, March 2023**

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“The impressive capabilities of generative AI have created a sense of urgency for companies to reimagine their products and business models.

<b>OpenAI’s GPT-4</b>	<b>OpenAI and Bain &amp; Company partnership</b>	<b>Meta’s LLaMA</b>
<b>Google’s PaLM API</b>	<b>Microsoft 365 Copilot</b>	<b>Nvidia’s DGX Cloud</b>
<b>GitHub Copilot X</b>	<b>ChatGPT plugins</b>	<b>Amazon Bedrock</b>

Source: OpenAI, Bain & Company, Meta, Google, Microsoft, Nvidia, GitHub, Amazon.

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# ChatGPT plugins have the potential to unlock many new use cases of AI



## Expedia

Bring your trip plans to life—get there, stay there, find things to see and do.



## FiscalNote

Provides and enables access to select market-leading, real-time data sets for legal, political, and regulatory data and information.



## Instacart

Order from your favorite local grocery stores.



## KAYAK

Search for flights, stays and rental cars. Get recommendations for all the places you can go within your budget.



## Klarna Shopping

Search and compare prices from thousands of online shops.



## Milo Family AI

Giving parents superpowers to turn the manic to magic, 20 minutes each day. Ask: Hey Milo, what's magic today?



## OpenTable

Provides restaurant recommendations, with a direct link to book.



## Shop

Search for millions of products from the world's greatest brands.



## Speak

Learn how to say anything in another language with Speak, your AI-powered language tutor.



## Wolfram

Access computation, math, curated knowledge & real-time data through Wolfram|Alpha and Wolfram Language.



## Zapier

Interact with over 5,000+ apps like Google Sheets, Trello, Gmail, HubSpot, Salesforce, and more.

Source: OpenAI website.  
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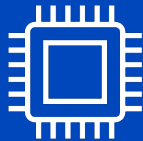


ChatGPT has brought generative AI into the spotlight, but the potential of generative AI goes beyond just ChatGPT

<b>Example applications</b>	<b>Text</b>	<b>Audio</b>	<b>Image</b>
	ChatGPT by OpenAI	MusicLM by Google	Stable Diffusion by Stability AI
	<b>Video</b>	<b>Code</b>	<b>Other applications</b>
	AI video generator by Synthesia	Copilot X by GitHub	

Source: WisdomTree, OpenAI, Google, Stability AI, Synthesia, GitHub.  
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# AI innovations create numerous use cases of generative AI across various industries

By 2025, Gartner expects **more than 30%** — up from zero today — of **new drugs and materials** to be systematically discovered using **generative AI techniques**.

 <p>Drug discovery</p>	 <p>Material science</p>	 <p>Chip design</p>
 <p>Synthetic data</p>	 <p>Generative design of parts</p>	

Source: Gartner, “Beyond ChatGPT: The Future of Generative AI for Enterprises” published 26<sup>th</sup> January 2023.  
Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.



**WisdomTree's take on  
the Artificial Intelligence Value Chain**



## A year-long collaboration between WisdomTree and leading technology experts - NASDAQ and the CTA



**WisdomTree, NASDAQ and CTA** have collaborated to **create a new index** designed to capture the investment opportunity in **artificial intelligence**

**NASDAQ** is a leading provider of trading, clearing, exchange technology, listing, indices, information and public company services across six continents

**CTA** is the trade association representing the U.S. consumer tech industry, providing policy advocacy, market research, technical education, standards development etc.

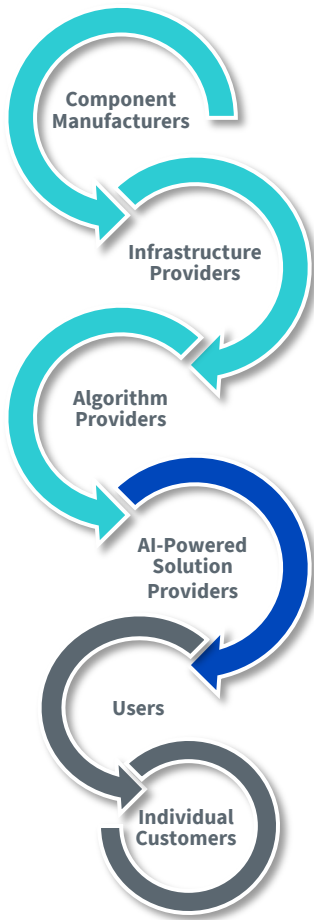
**CTA has partnered with Nasdaq since 2010** providing guidance for indexes in numerous technology segments including artificial intelligence & robotics, cybersecurity, cloud computing, mobile payments, and smartphones

**CTA** is actively engaged in **AI technology, policy and market research**

**CTA's Industry Intelligence** team boasts **nearly 40 years of combined experience** in electronics, technology and telecom industries

Source: WisdomTree, CTA, Nasdaq.  
Listing on NASDAQ exchanges or CTA membership are not criteria in the company selection or portfolio construction  
**You cannot invest directly in an index. Historical performance is not an indication of future performance and any investments may go down in value.**

# Capturing the AI value chain



Chip manufacturers, platform and algorithm providers power the development and running of AI-powered products & services.

They are classified into:



## Enhancers

Companies who are a prominent force in AI but whose relevant product or service is not currently a core part of their revenue



## Enablers

Companies who are key players in this space, with some of their core products and services enabling AI



## Engagers

Companies whose focus is in providing AI-powered products & services



Users / adopters are not represented in the index

Source: WisdomTree.

**You cannot invest directly in an index. Historical performance is not an indication of future performance and any investments may go down in value.**

## Introducing engagers



### + Engagers

- Directly selling AI & Machine Learning solutions
- AI central to their business model and revenue generation
- The most “pure play” of the AI investments in public equities

### + What do engager companies do?

- **Robotic Process Automation (RPA)** to augment human capabilities in many repetitive service jobs
- **Natural Language Processing (NLP) / chatbots** to respond to customers and users
- **Warehouse automation**
- **Electronic design automation** for designing integrated circuits
- **AI-enabled business services**, e.g. AI-enabled cybersecurity solutions
- **Forecasting and optimisation problems**, e.g. price optimisation, energy grid optimisation

Source: WisdomTree.

Any trading symbols, entities or investment products displayed are for illustrative purposes only and are not intended to portray recommendations.

## Introducing enablers



### + Enablers

- Some of their core products and services enable various AI applications

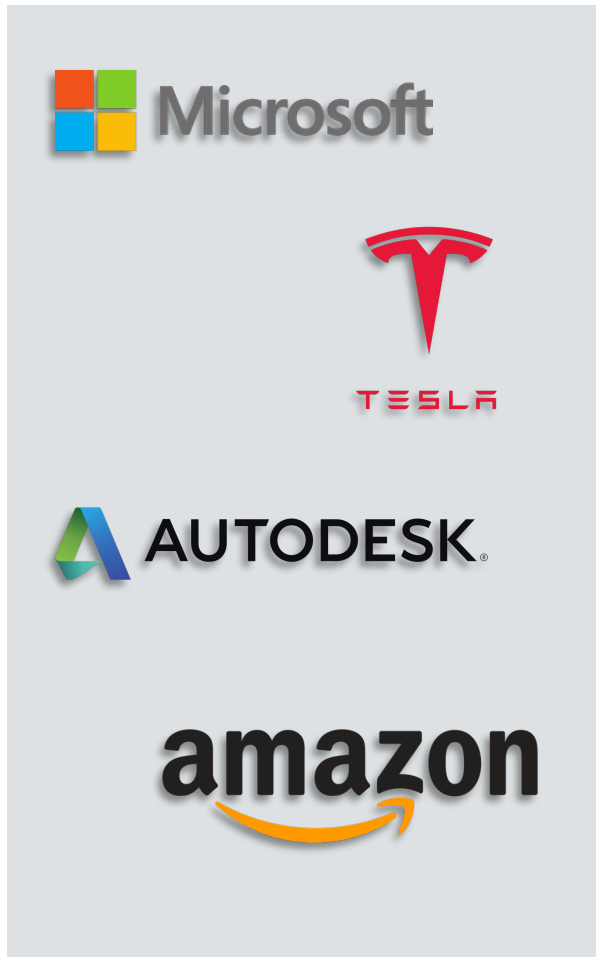
### + What do enabler companies do?

- **Deliver improvements in processing power:** Improvements in semiconductors are a big reason why AI has become a megatrend today and not 10 or 20 years ago.
- **Enable collection and analysis of data:** companies manufacturing sensors enable collection and processing of data with autonomous driving and industrial automation being one of the prominent use cases.
- **Develop novel ways to process and analyse data:** with the explosion of connected devices, there is a growing need for ultra-low power processing capabilities directly on the edge, i.e. edge AI.

Source: WisdomTree.

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## Introducing enhancers



### + Enhancers

- Important contributors to AI & Machine Learning space
- Core product or core service is not focused on AI
- Frequently, these companies are among the largest in the world, e.g. tech giants, and are doing many things

### + What do enhancer companies do?

- Working on **AI innovations to enhance core products and services**
- Developing **AI use cases in new industries**, e.g. agriculture, construction, online groceries
- **Autonomous vehicles**
- **AI & Machine Learning services** that can be deployed at scale through data centre infrastructure


Source: WisdomTree.

Any trading symbols, entities or investment products displayed are for illustrative purposes only and are not intended to portray recommendations.

# Questions

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[wisdomtree.eu](https://wisdomtree.eu)



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**Megatrends: the disruptive forces shaping our future**

[wisdomtree.eu/megatrend-etfs](https://wisdomtree.eu/megatrend-etfs)

# ETPedia

The educational guide to Exchange Traded Products (ETPs)

[wisdomtree.eu/etpedia](https://wisdomtree.eu/etpedia)

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