

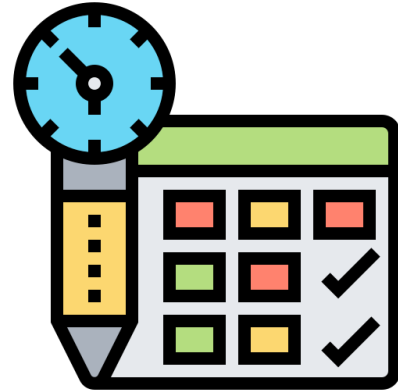


K2's Artificial Intelligence For Accounting And Financial Professionals

Learning Objectives



- Identify critical components of Artificial Intelligence
- Differentiate between Artificial Intelligence, Machine Learning, and Robotic Process Automation
- List examples of potential uses of Artificial Intelligence in accounting and financial environments
- Identify instances of AI features in applications such as Excel



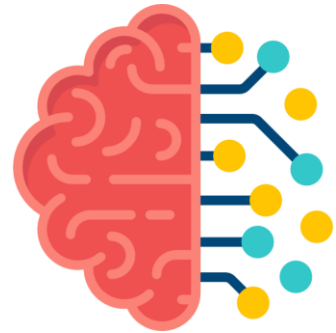
What is Artificial Intelligence? What are the major capabilities?

GETTING STARTED WITH AI

Artificial Intelligence (AI) Defined



- Computer science defines AI research as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals.
- Colloquially, the term "artificial intelligence" is used to describe machines that mimic "cognitive" functions that humans associate with other human minds, such as "learning" and "problem-solving."



Machine Learning (ML) Defined



- Machine learning is a subset of artificial intelligence.
- ML is focused on allowing programs to *learn* from past data without programming explicitly.
- In short, ML applies historical information when processing today's data without explicit programming.
- Almost all practical and useful examples of AI today are machine learning. While ML might seem complex, many tools and applications use ML every day. We're going to explore some of them today.



Key Differences Between AI & ML



	Artificial Intelligence	Machine Learning
Intention	Enabling a machine to simulate human behavior	Enabling a machine to automatically learn from past behavior without explicit programming
Goal	To make a smart computer system like humans to solve complex problems	To allow machines to learn from data so they can give accurate output
Scope	Build intelligent systems to perform any task as well or better than a human	We teach machines with data to perform a particular task and give an accurate result
Outcome	AI system is concerned about maximizing the chances of success	Machine learning is mainly concerned about accuracy and patterns
Examples in Today's World	The main applications of AI are Siri, customer support game playing, intelligent humanoid robot, etc.	The main applications of machine learning are recommendation, search algorithms, etc.



Read an awesome article which breaks down the major characteristics of both Machine Learning and Artificial Intelligence at <https://bit.ly/3sXSA9Z>

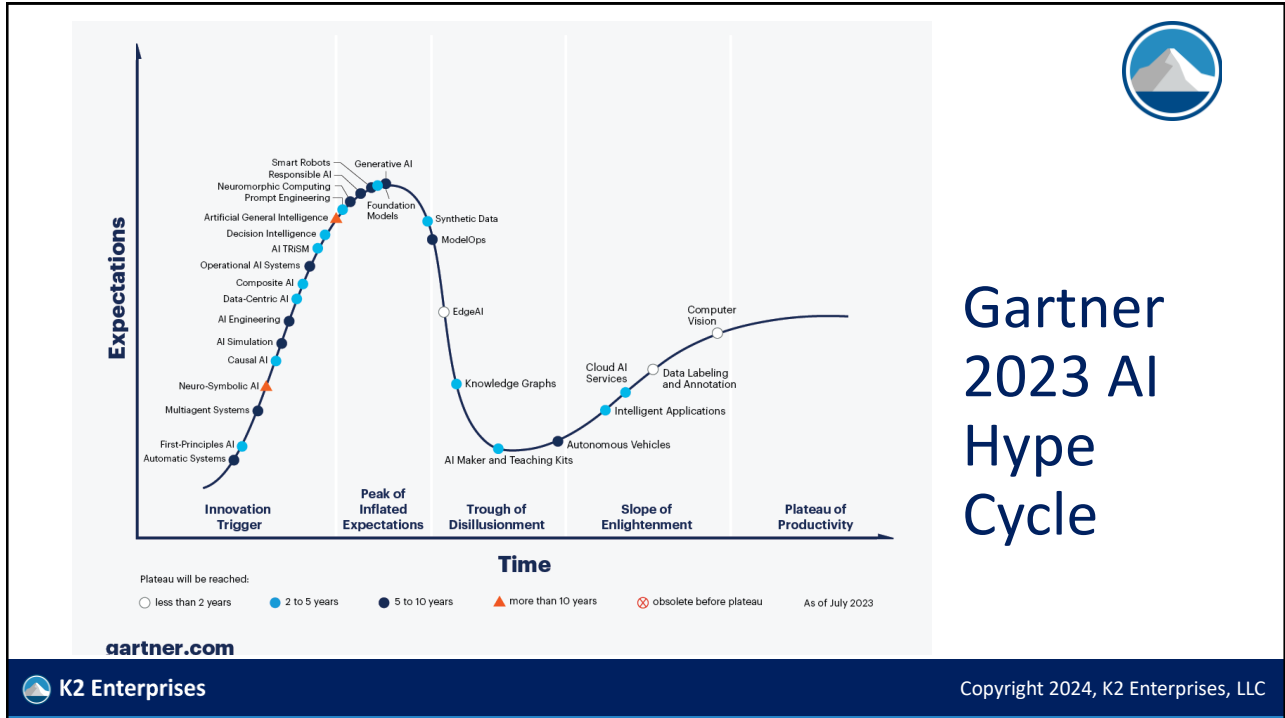
Examples Of AI In Business Today



- Alphabet (Google) uses AI to power their self-driving car, Waymo, search results, and their assistant, Duplex.
- Amazon uses AI to power their Alexa digital assistant, product recommendations, etc.
- Microsoft uses AI throughout its company and products, from Power Automate to Cortana.
- Apple uses AI to improve security with tools such as Face ID for biometric authentication.
- Facebook uses AI to power the information and advertisements you consume on its platform.



Read more at <https://bit.ly/3lpBbHw>



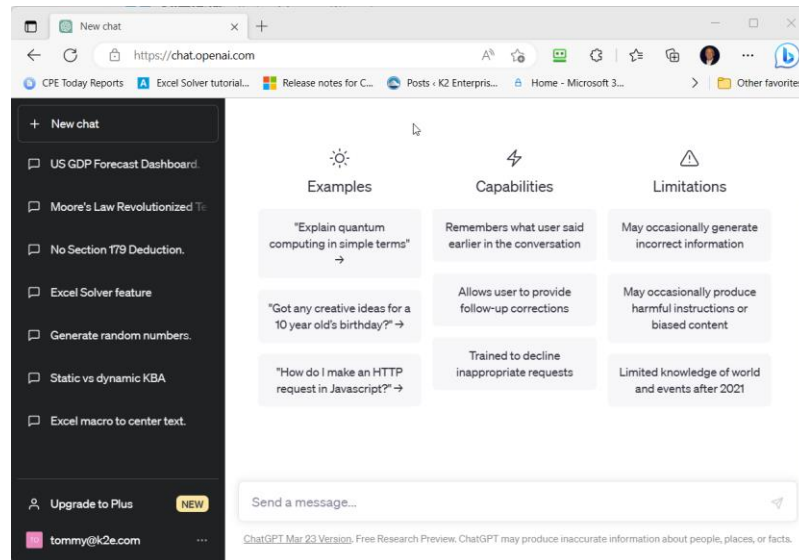
So, Why All The Recent Buzz About AI?

Generative AI!

K2 Enterprises

Copyright 2024, K2 Enterprises, LLC

And The Latest Star Of The Show...



What Is Generative AI?



- Conceptually, generative AI is quite simple...it is a form of AI **that allows technology to generate customized responses to your questions and prompts**
- Recent advancements in **Large Language Models (LLMs)** allow generative AI tools such as **ChatGPT** and **Gemini** (*formerly titled **Bard***) to create responses to your questions
- It might be fair to think of generative AI tools as turbo-charged search engines

So, LLMs Must Be Important



- Absolutely, **LLMs are the backbone of generative AI** tools
- When properly trained on large data sets, **LLMs can understand, generate, and even predict human language**
- For example, **Gemini uses a model with 6,144 TB of data and 1.6 trillion parameters**
- By contrast, **GPT-3 has 45TB and 175 billion parameters**
- There is a tradeoff with LLMs...in general, **the bigger the data set, the better the capacity to learn more complex relationships between words**; however, large data sets require more computational capability...*Quantum Computing, anyone?*

Today's Biggest Generative AI Tools



ChatGPT

- Developed by **OpenAI**
- Launched in **November 2022**
- Microsoft has invested **\$13B**
- The free version (3.5) was last updated in January 2022
 - **v4.0 reopened recently**
- <https://chat.openai.com>

Gemini

- Went "live" in **March 2023**
- ~~Google continues to present Bard as an "experimental" tool~~
- Like ChatGPT, you sign up for a subscription
- Currently, **no charge** for Gemini
- <https://gemini.google.com/app>

Working With ChatGPT



- In general, you will work in ChatGPT much like working with your favorite search engine
- That is, simply type in your request and ChatGPT will attempt to respond
- Once you type your request, you can modify or append it
 - For example, to include more details or to change the format from simple text to a bullet-point memo



Working With ChatGPT



- Should you decide to upgrade to **ChatGPT Plus**, the monthly subscription fee is \$20
- **With the Plus subscription, you will have access to GPT-4**
- You can also browse, create, and use other GPTs
- **Further, you will have access to DALL-E, browsing, and Advanced Data Analysis**
- Finally, there is also an Enterprise version, known as **ChatGPT Enterprise**



Working With ChatGPT



- One very important option to configure in ChatGPT is **Custom instructions**
- To configure this option, **click the ellipses next to your name**
- Then **click Custom Instructions and tell ChatGPT a little about yourself**

Custom instructions ⓘ

What would you like ChatGPT to know about you to provide better responses?

I live in Woodstock, Georgia, a suburb of Atlanta.
I am a Certified Public Accountant.
I enjoy spectator sports, including Auburn University football. I also enjoy snow skiing, salt-water fishing, and spending time at the beach.

229/1500

How would you like ChatGPT to respond?

Call me Tommy.
ChatGPT should remain neutral in responses.
Responses should contain moderate degrees of detail and should be relatively formal.

144/1500

Enable for new chats

Cancel Save

ChatGPT And Custom Instructions



- Consider the response below received from ChatGPT after the Custom Instructions shown in the previous slide were entered into the system



data security issues and artificial intelligence



Certainly, **Tommy**. The intersection of data security and artificial intelligence (AI) is a topic of considerable importance. As a **Certified Public Accountant**, you likely appreciate the significance of safeguarding sensitive information, especially in the context of evolving technologies like AI.

Working With Gemini



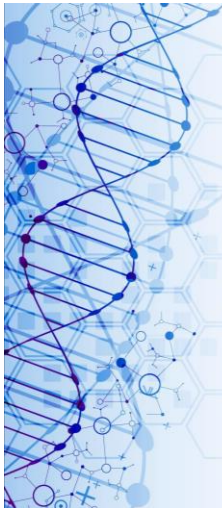
- In general, **working with Gemini will closely resemble working with ChatGPT**
- Again, **type in your request and Gemini responds**
- Remember, **Gemini uses an updated data set, capable of generating responses based on more recent data**



Working With Gemini



- Remember, there is a free plan for Gemini and there is also a paid subscription available
- When working with Gemini, **pay attention to the icons near the upper, right corner of your browser's window**
 - There you can **view a history of your queries, integrate with Google apps, access help and FAQs, view update history, and manage settings**





LET'S GO INTO DEMO MODE...

Generative AI In Tax & Accounting



- So far, the examples presented have centered around “generic” searches, similar in some regards to those that could have been performed using search engines
- Now, let’s move forward into **using generative AI in tax and accounting scenarios**

Tax Return Engagement Letter



The engagement letter partially pictured to the right was created by prompting Gemini with the phrase “**Tax Return Engagement Letter for an S Corporation...**”



Tax Return Engagement Letter for an S Corporation

[Date]

[Client Name]
[Client Address]

Dear [Client Name],

This letter is to confirm and specify the terms of our engagement with you to prepare the federal and state income tax returns for [Year] for [S Corporation Name].

Services to be Provided

We will provide the following services:

- Prepare the federal and state income tax returns for [Year] for [S Corporation Name], based on the information and documentation you provide to us.
- Review the returns with you before you file them.
- Answer any questions you have about the returns or tax planning.

Tax Return Engagement Letter





- Of course, you could simply **paste the text into your word processing application** and edit it to meet your specific needs
- Additionally, **note that Gemini provided three different versions of the engagement letter** and you could choose which version you want to use as your template


Tax Research




Like the previous example, you could enter the phrase “**does computer software qualify for Section 179 expensing**” into ChatGPT (3.5) and receive the response indicated to the right

Default (GPT-3.5) 

 As of my last knowledge update in January 2022, Section 179 of the United States Internal Revenue Code allows businesses to deduct the cost of certain types of property, including certain types of software, as an expense rather than requiring the cost to be capitalized and depreciated over time. This is known as "Section 179 expensing."

However, the specific eligibility of software for Section 179 expensing can depend on the nature of the software and how it is used in your business. Generally, software that is considered off-the-shelf or "canned" software, which is readily available for purchase by the general public, is eligible for Section 179 expensing. 

 **Get citation**

Tax Research



- **What if you need more details** in the responses you receive from your query?
 - **Tell your AI tool to provide that level of detail to you!**
- For example, consider the following prompt entered into Gemini
 - *I'm researching the impact the Secure Act 2.0 has on 401(k) plans. In a bullet point list, provide the most relevant verbatim excerpts from the document, with a citation at the end of each quote to the exact section to find the excerpt in the results*

Tax Research Results

*(generated by
Gemini)*

Impact of the Secure Act 2.0 on 401(k) plans:



- **Automatic enrollment for new plans:** Beginning in 2025, all new 401(k) and 403(b) plans will be required to automatically enroll eligible employees at a default contribution rate of between 3% and 10% of their compensation. The default rate will increase by 1% each year until it reaches at least 10%, but not more than 15% of compensation. Employees will have the option to opt out of automatic enrollment. (SECURE Act 2.0, Section 101)
- **Expanded participation for part-time workers:** Beginning in 2025, employers will be required to allow long-term, part-time workers to participate in their 401(k) plans. A long-term, part-time worker is defined as an employee who has worked at least 500 hours per year for three consecutive years. (SECURE Act 2.0, Section 102)
- **Increased age for required minimum distributions (RMDs):** The age at which participants must begin taking RMDs from their 401(k) plans has been increased from 72 to 73, effective for plan years beginning after December 31, 2022. The age will increase to 75 for plan years beginning after December 31, 2032. (SECURE Act 2.0, Section 103)
- **Reduced penalty for failing to take RMDs:** The penalty for failing to take an RMD has been reduced from 50% to 25% of the RMD amount. This penalty applies to RMDs that are not taken in a timely manner, but it does not apply to RMDs that are missed altogether. (SECURE Act 2.0, Section 104)

Responding To IRS Notices



- Another useful application of generative AI tools such as ChatGPT and Gemini is their capability to create drafts of responses to tax notices
- For example, consider an IRS CP-12 notice, indicating the taxpayer owes \$1,000 and you believe the IRS is in error
- You could enter the phrase “Respond to IRS CP-12 where John Jones owes \$1,000 and disagrees with the IRS”

Creating Responses To IRS Notices

(generated by ChatGPT)



- 1. Review the Notice:**
Carefully go through the CP-12 notice to understand the specific details of the IRS's claim. Verify the tax period and the nature of the adjustment.
- 2. Gather Documentation:**
Collect all relevant documentation, including tax returns, receipts, and any supporting documents that can substantiate John Jones's position. This will be essential in building a case against the IRS's claim.
- 3. Contact the IRS:**
Reach out to the IRS using the contact information provided on the CP-12 notice. Explain the reasons for the disagreement and provide supporting documentation. It's advisable to remain calm and professional during any communication with the IRS.
- 4. Certified Mail:**
If you choose to send additional information or documentation, consider using certified mail with return receipt requested. This will provide proof of both the sending and receiving of your documents.
- 5. Request an Appeals Conference:**
If the disagreement persists, John Jones may have the option to request an appeals conference. This involves presenting the case to an independent IRS officer who will review the matter impartially.
- 6. Seek Professional Assistance:**
As a Certified Public Accountant, you might want to consider leveraging your expertise or

Creating Responses To IRS Notices



- Although the guidance provided in the previous slide might be helpful, particularly to less-experienced staff, you may have been hopeful of getting a draft of the **actual response letter** created by your AI tools
- Modifying your request to *“Create a response letter to IRS CP-12 where John Jones owes \$1,000 and disagrees with the IRS”* generates the draft response indicated on the next slide

Creating Responses To IRS Notices

(generated by ChatGPT)



I hope this letter finds you well. I am writing in response to CP-12, which indicates that John Jones owes \$1,000, a claim he disputes.

Upon reviewing the notice, we respectfully disagree with the proposed adjustment. We have conducted a thorough examination of the relevant tax period and have gathered supporting documentation to substantiate our position.

Enclosed, please find copies of the tax returns, receipts, and any other pertinent documents that support our claim. We believe that these materials will provide clarity on the matters in question. We request that you review this information in reconsidering the proposed adjustment.

If necessary, I am open to further discussions or meetings to discuss this matter in detail. Additionally, I would appreciate guidance on any specific procedures or documentation required to facilitate a resolution.

Please be advised that we have also retained copies of this correspondence for our records.

Thank you for your prompt attention to this matter. We look forward to resolving this issue amicably.

Sincerely,

[Your Full Name]

Microsoft Copilot



- **Copilot** is an AI-based platform that works much like a personal assistant and is powered by **ChatGPT-4**
- Copilot is available in **Windows 11** and you can enable it by going to **Settings, Personalization, Taskbar, and toggling the Copilot toggle switch "ON"**
- You can also access Copilot in the Edge browser using a feature known as **Bing Chat**
 - Open the Edge Browser and enter a search phrase
 - Edge populates a pane on the right side of the Window with the search response

Microsoft Copilot



- Once you enable Copilot, you can use it to access ChatGPT-4 by clicking the Copilot icon in the Taskbar and typing your topic of interest, such as *“compare the advantages and disadvantages of operating as an S corporation from an income tax perspective”*

Microsoft Copilot



Question	Response
<p>Compare the advantages and disadvantages of operating as an S corporation from an income tax perspective.</p> <p>✓ Searching for: advantages and disadvantages of S corporation from an income tax perspective ✓ Generating answers for you...</p>	<p>Operating as an S corporation from an income tax perspective has both advantages and disadvantages. Here are some of the main points to consider:</p> <p>Advantages:</p> <ul style="list-style-type: none">• Avoidance of double taxation. The earnings of an S corporation are only taxed once, at the level of its shareholders. This is significantly better

More On Copilot



- A paid subscription to Copilot also integrates with Microsoft 365, where you can use it to do things such as:
 - Automatically respond to emails
 - Create PowerPoint presentations from Word documents
 - Summarize threads of email messages
 - Summarize Chat content from a thread of messages
 - Create transcripts of meetings
- Copilot became generally available as a subscription tool on 11/1 for companies with more than 300 Microsoft 365 users

Copilot Is Now Available For Most 365 Subscribers



- **In January**, Microsoft announced the removal of the 300-license restriction!
- The cost of the paid subscription is \$30 per month, but you still must have a qualifying Microsoft 365 subscription (Microsoft 365 Business Standard, Business Premium, E3, E5, Office 365 E3, or E5)

Microsoft Copilot Commercial Lineup



Microsoft Copilot commercial SKU line-up

	Copilot in Windows	Bing Chat Enterprise	Microsoft 365 Copilot
Microsoft Copilot UX	✓	✓	✓
Bing Chat (LLM + Web)	✓	✓	✓
Commercial Data Protection		✓	✓
Microsoft 365 Enterprise Security, Privacy, and Compliance			✓
Microsoft 365 Chat			✓
Microsoft 365 Apps			✓

Other AI Tools You Should Consider



- **Grammarly**, for improved writing
- **Originality**, to test for copyright infringement/plagiarism
- **Excel's Analyze Data and Insights in Power BI**, to identify "items of interest" in data sets
- **FORECAST.ETS** and **Forecast Sheets** in Excel
- **MindBridge** for fraud detection

Are There Dangers With AI? *Absolutely!*



Biased
Outputs

Copyright
infringement

Data privacy

Data security

Deepfakes

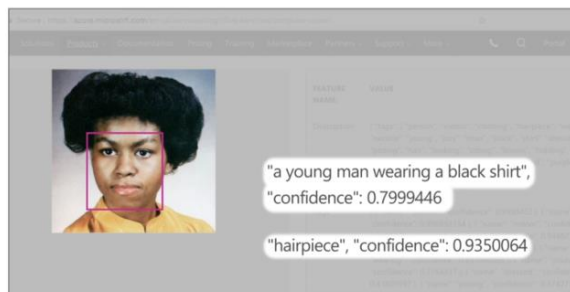
Hallucinations

Biased Outputs



- AI systems can be biased, either **intentionally** or **unintentionally**
- Bias can exist around any factor, including personal ones such as race, gender, and age
- For example, consider the case of **Michelle Obama**

Michelle Obama



Copyright Infringement



Who owns the copyright to materials generated by AI?

Response, Per ChatGPT

Generally, the entity or individual that creates the AI-generated content is considered the copyright owner. However, this may vary based on jurisdiction and specific contractual agreements.

Response, Per Gemini

In the United States, the Copyright Office has stated that it will not register works that were created by an autonomous AI tool. This means that, under current US law, AI-generated works are either in the public domain or they are derivative works of the materials that the AI was trained on.

Copyright Infringement



New York Times Has Sued MSFT & OpenAI!

- In December, NYT sued Microsoft and ChatGPT's parent company, OpenAI
- The Times alleges *"mass copyright infringement"*
- The Times continues with *"These tools were built with and continue to use independent journalism and content that is only available because we and our peers reported, edited, and fact-checked it at high cost and with considerable expertise"*
- One example provided by the Times OpenAI's software producing almost identical text to a Times article about predatory lending practices in New York City's taxi industry

Data Privacy



- Consider the type of data you might “feed” into an AI tool or platform. How comfortable are you that sensitive data remains private and not identifiable back to an individual or an organization?
- Other issues include
 - Is there informed consent about collection and use
 - The threat of exposing sensitive data through a breach or attack
 - Lack of transparency regarding use of an individual’s or organization’s data

Data Security



- Like other large caches of data, the **data stored in AI tools and platforms can present an inviting target because of the private nature of the data**
- Additionally, a general lack of human oversight can increase the vulnerability of the data
- Moreover, **the complexity of AI systems presents challenges concerning storing and protecting sensitive data**
- In fact, as reported on 11/10/23, Microsoft temporarily blocked team members from using ChatGPT due to security concerns

Deepfakes



- **Deepfakes involve using AI to generate realistic images, audios, and videos so that they appear to represent an authentic person engaging** in some activity in which the person did not engage
- For example, a deepfake exists that appears to show Mark Zuckerberg bragging that he has control of data stolen from billions of people
- You can see some outstanding – and scary! – examples of deepfakes on YouTube at <https://k2e.fyi/deepfakes>

Hallucinations



- Like humans, **AI is not perfect!**
- Sometimes, AI “hallucinates” and generates a faulty response that seemingly does not represent the data
- Often, **these hallucinations are based on anomalies in the AI model or issues associated with training the model**
- As an example, **Gemini incorrectly asserted in February 2023 that the Webb Space Telescope took the first image of a planet outside the solar system...in fact, the pictures of an exoplanet were taken in 2004**



Not all AI is made the same. Let's explore today's and the future of AI.

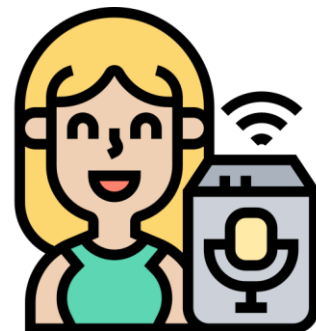
LET'S EXPLORE THE DIFFERENT TYPES OF ARTIFICIAL INTELLIGENCE

Narrow, General And Super AI



Narrow Focused AI

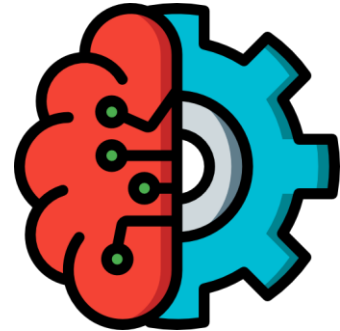
- Narrow AI is AI that is programmed to perform a single task — whether it's checking the weather, being able to play chess, or analyzing raw data to write journalistic reports.
- Narrow AI is not conscious, sentient, or driven by emotion the way humans are. Narrow AI operates within a pre-determined range, even if it appears to be much more sophisticated than that.
- Every sort of machine intelligence that surrounds us today is Narrow AI. Google Assistant, Amazon Alexa, Siri, and other natural language processing tools are examples of Narrow AI.
- Narrow AI has relieved us of many tedious, routine, mundane tasks that we don't want to do.
- Learn more at <http://bit.ly/2GlcGfX>



Narrow, General And Super AI

General/Strong Artificial Intelligence

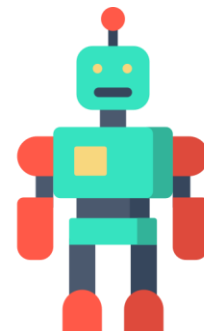
- Artificial General Intelligence (AGI) or “Strong” AI refers to machines that exhibit human intelligence. In other words, AGI can successfully perform any intellectual task that a human being can.
- Currently, machines can process data faster than we can. But as human beings, we still can think abstractly and strategically- using our intelligence makes us superior to machines.
- AGI is expected to be able to reason, solve problems, make judgments under uncertainty, plan, learn, integrate prior knowledge in decision-making, and be innovative, imaginative, and creative.
- AGI does not exist at this point and probably won’t for at least 10+ years.
- Learn more at <http://bit.ly/2GlcGfX>



Narrow, General And Super AI

Artificial Super Intelligence

- Artificial Super Intelligence (ASI) will surpass human intelligence — from creativity to general wisdom to problem-solving. Machines will be capable of exhibiting intelligence that we haven’t seen in the brightest amongst us.
- This is the type of AI that many people are worried about and the type of AI that people like Elon Musk think will lead to the extinction of the human race.
- ASI does not exist and probably won’t, at least for 30+ years. Several massive technology hurdles must be overcome to make this a possibility. Most of these hurdles are not even known at this point.
- Learn more at <http://bit.ly/2GlcGfX>





Machine Learning, Neural Networks and Deep Learning

LET'S EXPLORE THE OTHER THREE MAIN SUBSETS OF ARTIFICIAL INTELLIGENCE

Machine Learning



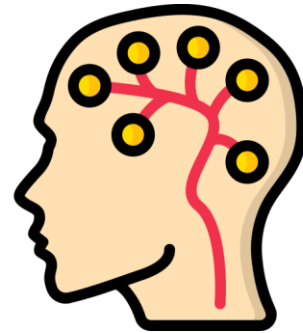
- Machine learning is a branch of [artificial intelligence](#) based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention.
- The iterative aspect of machine learning is important because as models are exposed to new data, they can adapt independently. They learn from previous computations to produce reliable, repeatable decisions and results.
- The heavily excited, self-driving Google car? The essence of machine learning.
- Online recommendation offers such as those from Amazon and Netflix? Machine learning applications for everyday life.
- Fraud detection? Machine learning determines transactions that don't fit a consumer's typical spending habits.
- In essence, machine learning is a combined effort of human knowledge and machine calculations. Humans are teaching the machines what to know.



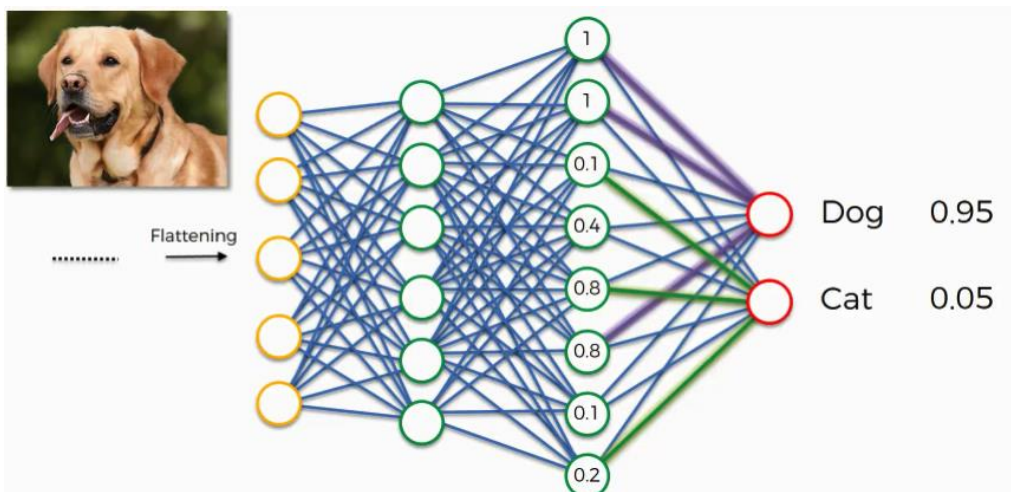
Artificial Neural Networks



- A neural network is not an algorithm but a framework for many different [machine learning](#) algorithms to work together and process complex data inputs.
- Such systems "learn" to perform tasks by considering examples, generally without being programmed with any task-specific rules.
- For example, in [image recognition](#), they might learn to identify images that contain cats by analyzing example images that have been manually [labeled](#) as "cat" or "no cat" and using the results to identify cats in other images.
- They do this without any prior knowledge about cats, for example, that they have fur, tails, whiskers, and cat-like faces. Instead, they automatically generate identifying characteristics from the learning material they process.
- The neural network learns what a dog is by processing many images of existing dogs and animals. It learns the characteristics and then can apply its knowledge to future/new photos of animals.



Recognizing A Dog From All Animals

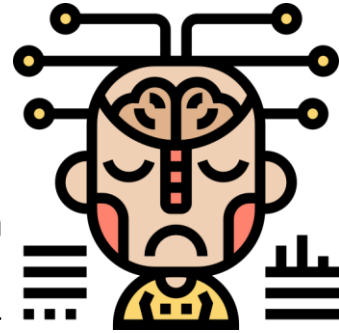


Artificial Neural Networks



Predicting the Selling Price of a Home

- A neural network takes several input variables, including square footage, location, the prior selling price of similar homes in the area, macroeconomic variables (e.g., unemployment rate, interest rates, etc.), etc.
- It performs a variety of internal calculations using temporary values and then gives the user a single output.
- The model gets better with every home sold as it has additional and newer data to learn from.



What to keep an eye out for in the current and coming year.

AI TRENDS TO WATCH

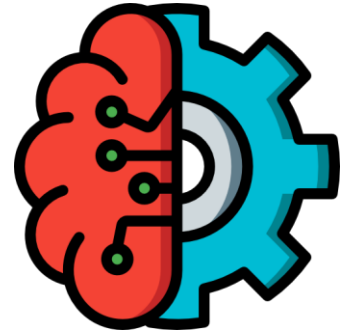
3 Things AI Can Do Right Now



AI can be used today inside your organization.

There are at least three major areas which you can consider using AI in your organization.

- **Process automation.** Doing “back-office” routine tasks.
- **Cognitive insight.** Looking at data and interpreting the meaning.
- **Cognitive engagement.** Working with customers and staff.



Will Robots Really Steal Our Jobs?



An international analysis of the impact of automation

- Artificial intelligence isn't going to steal your job, but automation certainly can.
- AI could contribute up to 14% of global GDP by 2030.
- Automation will affect lower value and lower education jobs first, but higher value jobs are at risk in the long term.
- Safest jobs? Education and healthcare.
- Riskiest jobs? Transportation and manufacturing.
- Learn more at <https://pwc.to/3H5r2yr>

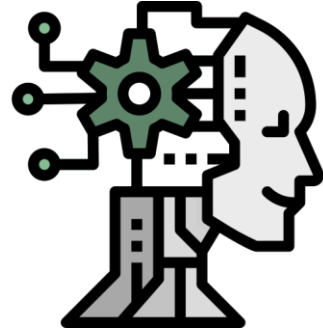


Will Robots Really Steal Our Jobs?



An overview of the three waves

- **Algorithm wave:** Computational jobs are more likely to be replaced by machine learning software.
- **Augmentation wave:** The need for repetitive tasks will decrease as machines automate them and people have less time to work.
- **Autonomy wave:** AI and robotics will automate routine tasks involving physical labor or manual dexterity.

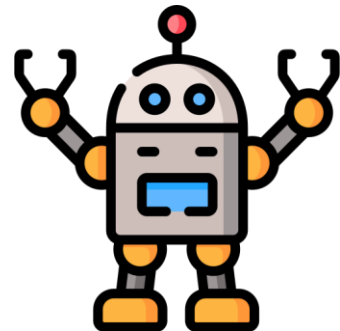


Will Robots Really Steal Our Jobs?



Wave 1: Algorithmic wave (to early 2020s)

- Automation of simple computational tasks and structured data analysis, affecting data-driven sectors such as financial services.
- **Tasks Impacted.** Computational jobs are more likely to be replaced by machine learning software.
- **Industries Impacted.** Data-driven sectors like financial and insurance, information and communication, and professional, scientific, and technical services.

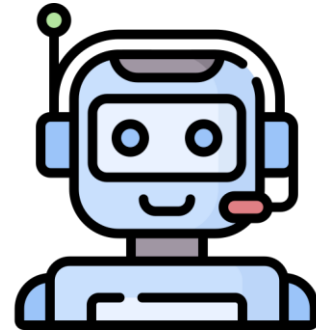


Will Robots Really Steal Our Jobs?



Wave 2: Augmentation wave (to late 2020s)

- Dynamic interaction with technology for clerical support and decision-making. It also includes robotic tasks in semi-controlled environments, such as moving objects in warehouses.
- **Tasks Impacted.** The need for repetitive tasks will decrease as machines automate them and people have less time to work.
- **Industries Impacted.** The financial and insurance sector will continue to be highly impacted, along with other sectors with a higher proportion of clerical support, including public and administration, manufacturing, and transport and storage.

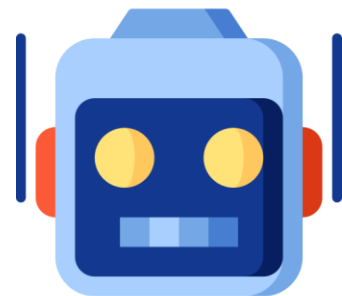


Will Robots Really Steal Our Jobs?



Wave 3: Autonomous wave (to mid-2030s)

- Automation of physical labor, manual dexterity, and problem-solving in dynamic real-world situations requiring responsive actions, such as transport and manufacturing.
- **Tasks Impacted.** AI and robotics will automate routine tasks involving physical labor or manual dexterity.
- **Industries Impacted.** Sectors like construction, water, sewage and waste management, and transportation and storage with the advent of fully autonomous vehicles and robots.

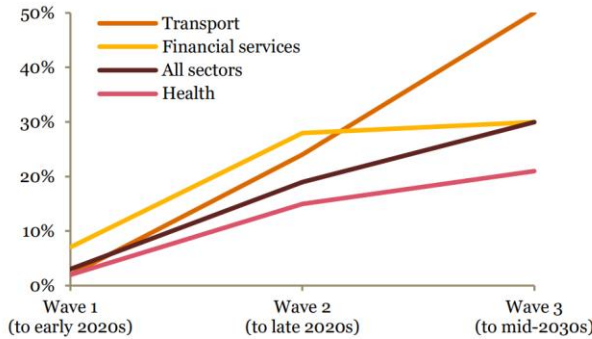


Will Robots Really Steal Our Jobs?



Financial professionals most at risk at Wave 2

% of existing jobs at potential risk of automation



“Financial services jobs could be relatively vulnerable to automation in the shorter term, while transport jobs are more vulnerable to automation in the longer term.”

Read more at
<https://pwc.to/3H5r2yr>

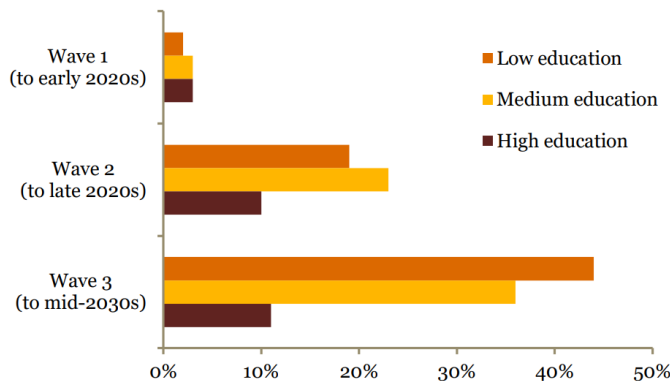
Source: PwC estimates based on OECD PIAAC data (median values for 29 countries)

Will Robots Really Steal Our Jobs?



Lower education workers are more at risk

% of existing jobs at potential risk of automation



“In the long run, less well-educated workers could be particularly exposed to automation, emphasizing the importance of increased investment in lifelong learning and retraining.”

Read more at
<https://pwc.to/3H5r2yr>



AI & Automation in Tools You're Using Today

AI IN MICROSOFT APPLICATIONS & TOOLS

Let's Look At Today's Applications



There are **TONS** of AI tools all around us! Let's explore how we can use AI functionalities in today's typical business applications. Specifically, let's look at the Microsoft ecosystem of products, including:

- Microsoft Excel
- Microsoft Power BI
- Microsoft Power Automate



Artificial Intelligence In Excel



Today's Major AI Functionalities

Excel has several artificial intelligent capabilities built into the application. Let's look at a couple of them and how they are used inside the application.

- Ideas / Insights / Analyze Data
- New data types
- Insert Data from Picture
- Dynamic arrays
- Flash Fill
- Power Query



Ideas / Insights / Analyze Data



Ask your data questions and get real answers

- Analyze Data in Excel empowers you to understand your data through natural language queries that allow you to ask questions about your data without writing complicated formulas. In addition, Analyze Data provides high-level visual summaries, trends, and patterns.
- Select a cell in a data range > select the Analyze Data button on the Home tab. Analyze Data in Excel will analyze your data and return engaging visuals about it in a task pane.
- Learn more at <https://bit.ly/3tEqqF>



Data Types



Connect to reputable data right inside Excel

- [Linked data types](#) connect to reputable data sources, such as Bing, [Wolfram](#), Power BI, and more, so you can access information about a variety of subjects without ever leaving Excel.
- You can get stock and geographic data in Excel. It's as easy as typing text into a cell and converting it to the Stocks data type or the Geography data type.
- Go to the Data tab and click either Stocks or Geography.
- Learn more at <https://bit.ly/3CoJL7y>

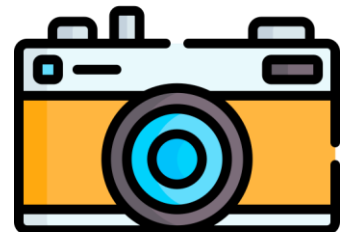


Insert Data From Picture



Load data into Excel from a photo

- Want to turn images that have table data into data that you can edit in Excel? With the Data from Picture feature, it's a snap.
- With the Data from Picture feature, you can insert data from a screen clipping on your clipboard, an image file from your computer, or your iPhone camera.
- Click Data > Data From Picture > Picture From File.
- Currently only supported on the mobile version of Excel.
- Learn more at <https://bit.ly/3hTyO14>



Flash Fill



Pattern recognition right inside of Excel

- Flash Fill automatically fills your data when it senses a pattern. For example, you can use Flash Fill to separate first and last names from a single column or combine first and last names from two different columns.
- If Flash Fill doesn't generate the preview, it might not be turned on. You can go to Data > Flash Fill to run it manually or press Ctrl+E. Go to Tools > Options > Advanced > Editing Options > check the Automatically Flash Fill box to turn Flash Fill on.
- Learn more at <https://bit.ly/3MzZTHZ>



Power Query



Extract and load data from anywhere into Excel

- Power Query is a data transformation and data preparation engine.
- Using Power Query, you can perform the extract, transform, and load (ETL) processing of data.
- Probably the best feature added to Excel in the last 10+ years.
- This feature will revolutionize how you use Excel. It can easily save you hours and days.
- Learn more at <https://bit.ly/3uH14gB>



AI Features In Power Query



- There are several AI features of Power Query, but a couple worth mentioning:
 - Data Extraction By Example
 - Add column from examples
 - Web By Example
 - Fuzzy Merge correlates data across disparate sources
- Learn more at <https://bit.ly/3wPkNNI>



Microsoft Power BI



- Power BI is a business intelligence and reporting application and service.
- Power BI can create interactive dashboards and reports to allow users to visualize and better understand their data and gain insight.
- It is primarily a Windows desktop application, a SaaS-based service, mobile app.
- It utilizes several complimentary Excel functionalities, including Power Query.
- It's a FREE tool, and you can learn more at <https://powerbi.microsoft.com/en-us/>



AI Features In Power BI



- Major AI features inside of Power BI:
 - Key Influencer visual
 - Decomposition tree visual
 - Smart narrative visual
 - Q&A
 - AI Insights
 - Cognitive Services & Machine Learning
 - Anomaly detection
- Learn more at <https://bit.ly/3DENzSV>



Key Influencers Visualizations



- The key influencers visual helps you understand the factors that drive a metric you're interested in.
- It analyzes your data, ranks the factors that matter, and displays them as key influencers.
- For example, suppose you want to figure out what influences employee turnover, also known as churn. One factor might be employment contract length, and another factor might be commute time.
- Learn more at <https://bit.ly/3NDk1t6>



Smart Narratives



Summarize your data with text

- The innovative narrative visualization helps you quickly summarize visuals and reports. It provides relevant, creative insights that you can customize.
- Use smart narrative summaries in your reports to address key takeaways, point out trends, and edit the language and format for a specific audience.
- In PowerPoint, instead of pasting a screenshot of your report's key takeaways, you can add updated narratives with every refresh. Your audience can use the summaries to understand the data, get to key points faster, and explain the data to others.
- Learn more at <https://bit.ly/3iNSd7g>



Q&A



Ask your data a question and answers

- Sometimes the fastest way to get an answer from your data is to ask a question using natural language.
- The Q&A feature in Power BI lets you explore your data in your own words.
- Q&A recognizes the words you type and figures out where (in which dataset) to find the answer. Q&A also helps you form your question with auto-completion, restatement, and other textual and visual aids.
- Learn more at <https://bit.ly/35p214y>



AI Insights In Power BI



Pre-trained machine learning in Power BI

- In Power BI, you can use AI Insights to access a collection of pre-trained machine learning models that enhance your data preparation efforts.
- AI Insights is accessed in the Power Query Editor, and its associated features and functions are accessed through the Home and Add Column tabs in Power Query Editor.
- With text analytics and vision in AI Insights, you can do the following:
 - [Sentiment Analysis](#)
 - [Key Phrase Extraction](#)
 - [Language Detection](#)
 - [Image Tagging](#)
- Learn more at <https://bit.ly/3IRX5mr>



While different, these two topics are intertwined and occur together.

ARTIFICIAL INTELLIGENCE & AUTOMATION

What Is Automation?



- In business, automation is focused on the performance of a task without the need for human labor.
- Humans design automation procedures, but the work is performed between systems. Once initiated, it will continuously run on its own until intervention is required.
- An example of simple automation would be the thermostat in your home or fridge. It will maintain the temperature once set.
- A complex automation would be your car's traction control system that automatically adjusts based on multiple real-world conditions.



AI & Automation In Business



- Automation makes hardware or software that can do things automatically, without human intervention.
- Artificial intelligence is focused on decision-making.
- Automation can occur with or without artificial intelligence. When you use AI, you're also using automation most of the time. The two technologies complement each other well.
- Industrial automation can be done with sensors and basic programming. The automation responds to the output of the sensors. For example, a stoplight.
- Learn more about the differences between AI and automation, <https://bit.ly/3tT836Y>



Artificial Intelligence vs. Automation



	Artificial Intelligence	Automation
Decision Making	AI makes a decision based on the learning from experience & information it receives.	Automation is like preset and self-running to perform specific tasks.
Purpose	AI is a system that helps experts analyze situations and arrive at a particular conclusion.	Automation is a kind of machine programmed to carry out a routine job.
Repetition	AI is for non-repetitive tasks. Each task is separate and distinct from the other tasks.	While automation is for repetitive tasks based on commands and rules.
Learning and Changing	AI involves learning and evolving.	Automation does not involve learning and evolving.
Interaction with Humans	AI interacts with humans, and it learns from experience, compares situations, and then works according to it.	Automation can have no interaction with humans. It typically works on instructions.



Learn more at <https://bit.ly/38xLJaZ>



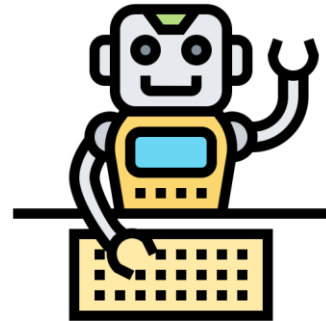
ROBOTIC PROCESS AUTOMATION (RPA)

Robotic Process Automation (RPA)



Business Automation Through Users

- Robotic process automation (RPA) is a form of business process automation technology based on metaphorical software robots (bots) or artificial intelligence (AI)/digital workers. It is sometimes referred to as software robotics (not to be confused with robot software).
- In traditional workflow automation tools, a software developer produces a list of actions to automate a task and interface to the back-end system using internal application programming interfaces (APIs) or dedicated scripting language.
- In contrast, RPA systems develop the action list by watching the user perform that task in the application's graphical user interface (GUI) and then complete the automation.



Examples Of What RPA Can Do



RPA can help with all types of tasks!

- Banking and finance process automation
- Mortgage and lending processes
- Customer care automation
- eCommerce merchandising operations
- Optical character recognition applications
- Data extraction process



Integration Platform As A Service



Trigger and action workflow tools

- Will have a “trigger” that will initiate a series of actions in other systems.
- Web and app-based integration tools allow for data sharing and integration with minimal technical and coding expertise.
- Virtually all configuration is done on the mobile handset or a webpage using your favorite browser.
- The tool takes care of all the security, authentication, and data management. To you, it’s a black box.
- Great option for simple integration projects, just getting started or exploring options.
- Virtually all the logic and programming needed to connect services are provided to you. No need to learn any programming, but it will help.



Example Using QuickBooks And HubSpot CRM



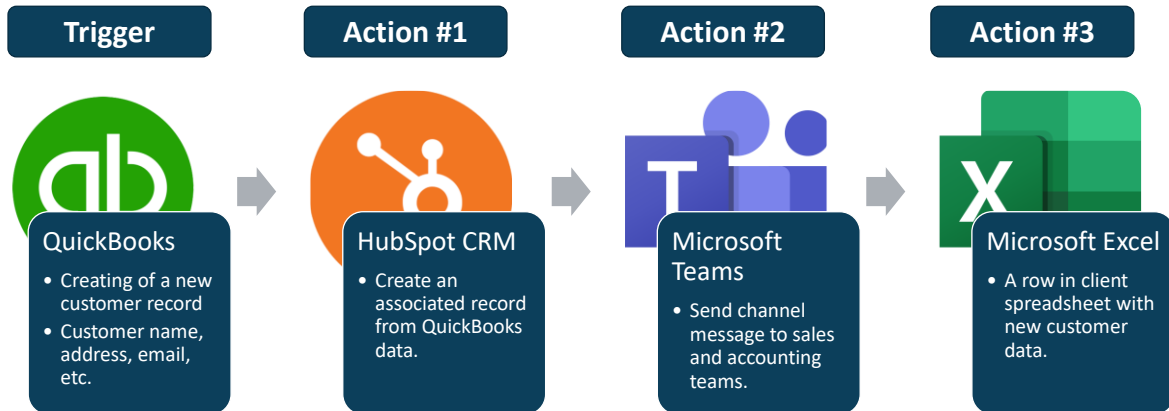
Easily push and pull data between systems

iPaaS tools can be used to automate several routine business functions around the accounting system. For example:

- Trigger, a new customer is created in QBO. Action, iPaaS tool creates the customer record in HubSpot.
- Trigger, the sales team updated the customer address in HubSpot. Action, iPaaS tool updates the customer address in QBO.
- Trigger, a new invoice is created in QBO. Action, iPaaS tool posts a message in Teams to let the sales team know.
- Trigger, an invoice is paid in QBO. Action, iPaaS tool updates the customer record showing the invoice as being paid in QBO and updates an Excel workbook tracking AR.



Triggers & Actions With iPaaS Tools



Integration And Data Sharing Tools



Major examples of this category of tool

- **Power Automate.** A powerful tool to connect resources inside and out of the Microsoft ecosystem of products.
- **If This, Then That (IFTTT).** A fantastic option for home, IoT, and personal projects.
- **Zapier.** Great option when many integration touchpoints are required and mostly web-based.
- **n8n (pronounced n-eight-n).** An awesome option that utilizes FREE and open-source technology.
- **Zoho Flow.** A great option for users who are already leveraging the power of Zoho.



Microsoft Power Automate (PA)



Turn outdated into automated

- **Automate quickly and more securely.** Empower everyone to build automated processes with flows in Power Automate. Use low-code, drag-and-drop tools and hundreds of pre-built connectors that automate repetitive, mundane tasks with ease.
- **Boost efficiency.** Record and visualize your end-to-end processes with a [process advisor](#), providing guided recommendations for creating flows and deep insights that take the guesswork out of what to automate.
- **Enhance workflows with AI.** Make your automation even smarter with [AI Builder](#). Quickly process forms using document automation, process approvals, detect images and text or create with prebuilt models.
- Learn more at <https://powerautomate.microsoft.com/>

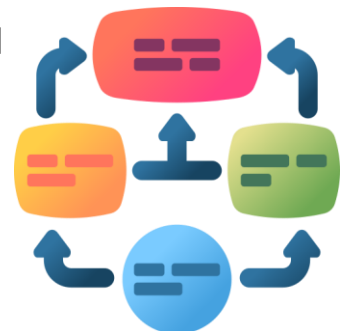


Power Automate Connectors



Connect power automate with anything!

- PA works with hundreds of popular web applications from Microsoft 365 to Mailchimp.
- Especially powerful for integrations from, to, and between Microsoft services.
- Allows connectivity to both cloud and on-premise technologies using a data gateway.
- Allows you to connect products and services which would not normally “speak to each other.” Instead, these products speak with Power Automate, and it moves the data between the connectors.



Benefits Of Power Automate



Compelling reasons to choose the platform

- **Inside the Microsoft ecosystem of products.** PA is part of the Power Apps product line from Microsoft. It can easily be added to your existing 365 licensing.
- **Easy integration with Azure.** Is your business using Azure for its Cloud? If so, you can easily access your data and applications with PA.
- Built with **solid security** and privacy.
- **Fantastic pre-built templates** to help you get started. There are hundreds of prebuilt templates connecting all types of applications to help you harness the power of the application.

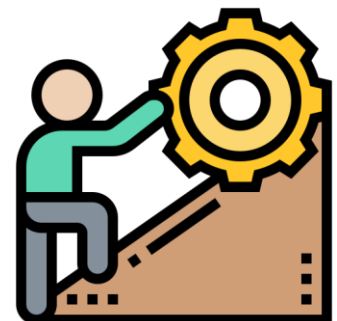


Challenges Of Power Automate



Limitations to acknowledge before getting started.

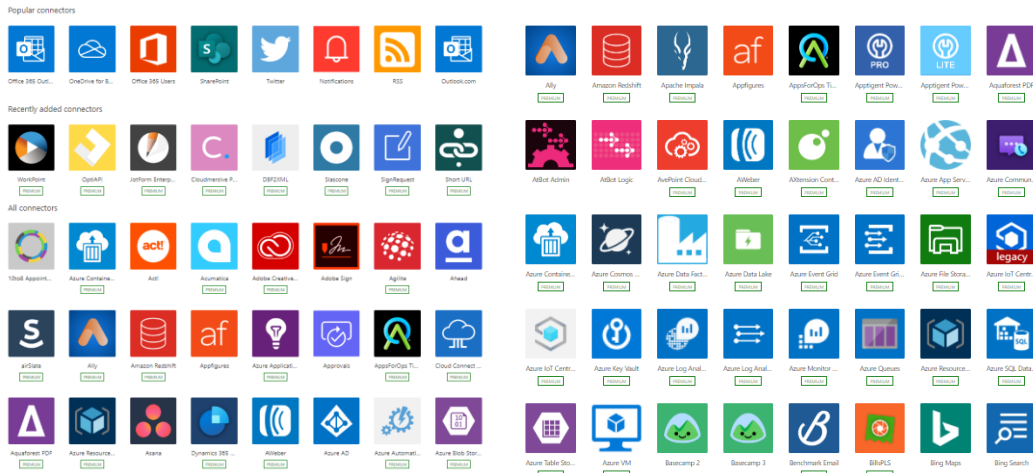
- As with all iPaaS tools, it can be a significant learning curve. Expect more time to get started implementing and setting up the tool.
- This learning curve can cause frustration and reluctance from staff to utilize the tool.
- PA isn't free, and there will be licensing costs.
- As with all iPaaS tools, your underlying data and workflow changes can cause your flows to stop working.
- PA isn't an excellent option for ad-hoc or one-off projects. It's best for repetitive tasks.



Power Automate Connectors



Connect Power Automate with everything!



Examples Of PA Templates



Start an approval when a file is added to Sharepoint

By Microsoft



Auto Approve Time Off Requests

By Microsoft



Send a customized email when a new file is added

By Microsoft



Notify a team when Planner tasks change status

By Microsoft



Get today's weather forecast for my current location

By Microsoft



Click a button to track work hours and work location in Google Sheets

By Microsoft



Send an email when an event is added, updated or deleted in Outlook

By Microsoft Power Automate Community



Save comments on Instagram posts to Google Sheets after one day

By Microsoft



Welcome new teams members and share their bio

By Microsoft



Email me with a list of upcoming Calendar events

By Microsoft



Protect a PDF document with a password and send via email

By PDF Blocks

Typical Cloud Flows In PA

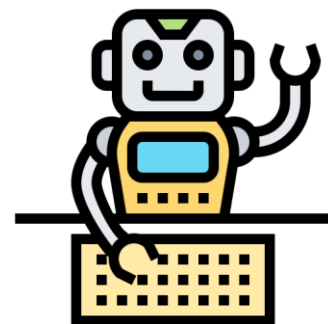


Flow type	Use case	Automation target
Automated flows	Create an automation triggered by an event, such as the arrival of an email from a specific person or a mention of your company on social media.	Connectors for cloud or on-premises services connect your accounts and enable them to talk to each other.
Instant flows	Start an automation with a click of a button. You can automate for repetitive tasks from your Desktop or Mobile devices. For example, instantly send a reminder to the team with a push of a button from your mobile device.	Wide range of tasks such as requesting an approval, an action in Teams or SharePoint.
Scheduled flows	Schedule an automation such as daily data upload to SharePoint or a database.	Tasks that need to be automated on a schedule.

Additional Power Automate Capabilities And Features



- **Robotic process automation.** Connect old and new systems and reduce repetitive tasks using UI-based automation with desktop flows—the Power Automate's robotic process automation (RPA) capability.
- **AI-Builder.** Create intelligent automation and find insights by building tailored AI models within Power Automate.
- **Process Advisor.** Simplify how you work by discovering workflow bottlenecks and automation opportunities through process advisor, Power Automate's process, and task mining capability.





AI is used everywhere! Let's look at some other awesome tools.

AI FUNCTIONALITY IN OTHER BUSINESS TOOLS

Intelligent Virtual Assistant (IVA)



You can ask them just about anything!

- IVAs are software agents that can perform tasks or services for an individual based on commands or questions.
- Using an IVA, you ask it questions such as the weather in Paris or the time of the sunrise in Chicago.
- IVAs can also interact with devices in your home or office. For example, turning on the lights or adjusting the thermostat.
- IVAs can be either a dedicated hardware device (e.g., Amazon Echo, Google Assistant, etc.) or a built-in feature of a device (e.g., Siri on an iPhone, Cortana on a Windows device).

Hardware IVAs In Today's Market



- Amazon Alexa Devices
<https://amzn.to/3N7DGkS>
- Google Nest Devices
<https://bit.ly/3ujEday>
- Apple HomePod Devices
<https://apple.co/3tpjWBo>
- Sonos Speakers (Alexa or Google)
<https://bit.ly/3Jtzdqw>
- Bose Speakers (Alex or Google)
<https://bose.life/3N9ve4p>



QuickBooks Online (QBO)



Bringing AI to small business

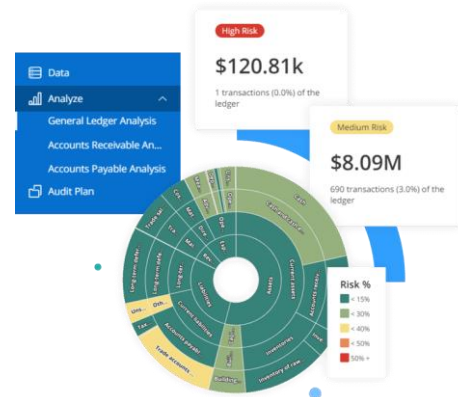
- More accessible several automation and AI tools to make bookkeeping more straightforward. For example, bank feeds and rules automatically import and categorize transactions right from your bank.
- Additional AI and automation features include:
 - Smart Money. Understanding financial health.
 - Smart Decisions. Automating bookkeeping and simplifying decision making.
 - Smart Connections. Connecting people, tools, and experts.
- Learn more at <https://smarter.quickbooks.com/>



Mind Bridge AI



- More effective audits with quantifiable risk assessment. Analyze 100% of transactions and become more efficient at spotting risks and anomalies. With more relevant information at hand, your auditors can better understand the risk of material misstatement and design more effective audits.
- Having sight into riskier transactions and data anomalies allows your team to focus their efforts where it matters most.
- Mind Bridge heightens your compliance with risk assessment standards by complementing your existing audit methodologies.
- Learn more at <https://bit.ly/3JW9uXU>



Grammarly



Your Writing, At Its Best.

- Grammarly is a plugin for your favorite Internet browser. Using a variety of AI corrects writing mistakes and helps you become a better writer.
- Grammarly corrects over 250 types of grammatical mistakes while also catching contextual spelling errors and poor vocabulary usage.
- Grammarly helps you write mistake-free on Gmail, Facebook, Twitter, Tumblr, LinkedIn, and nearly anywhere else you write on the web.
- They have a plugin for Microsoft Word and Outlook.
- They offer free and paid versions of their platform.
- Reduce writing mistakes and write more effectively with Grammarly. <https://grammarly.com>



Jasper.AI



AI to write original, creative content

Jasper.AI is a tool to help you write original, creative content. Primarily useful for sales and marketing, but it can be useful for all types of projects. For example:

- Generate educational blog articles that are keyword-rich and plagiarism-free.
- No matter your native tongue, write creatively and clearly in 25+ languages.
- Repurpose existing content and generate new content without hiring junior writers.
- Create original content that ranks for SEO



AWS Fraud Protection



Detect online fraud faster with machine learning

- Amazon Fraud Detector fully automates the creation of machine learning models that identify potential fraud for everyday online activities such as new account creations, online payments, and guest checkouts.
- The automated model-building process involves heavy lifting, such as data validation and enrichment, feature engineering, algorithm selection, hyperparameter tuning, and model deployment.
- You upload your dataset, select the model type, and Amazon Fraud Detector automatically finds the best-fitting fraud detection ML model.
- No coding or previous machine learning experience is required.
- Learn more at <https://go.aws/3qQi8Q1>

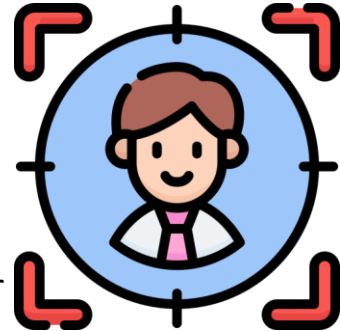


AWS Personalize



Create personalized user experiences

- Amazon Personalize enables developers to build applications with the same machine learning (ML) technology used by Amazon.com for real-time personalized recommendations – no ML expertise required.
- Deliver high-quality recommendations in real-time
- Easily implement personalized recommendations in days, not months
- Personalize every touchpoint along the customer journey
- Learn more at <https://go.aws/35p4SKO>



Summary & What We Learned



- We learned about the main components of artificial intelligence, including machine learning.
- We explored some of the significant trends of AI and its potential impact on the world.
- We discussed the relationship between AI and machine learning.
- We reviewed how AI is built into everyday tools, including Excel, Power BI, QuickBooks, and more.

