Module 1: Introduction to AI for Business

Lesson 1: AI. Two Letters, Infinite Potential

Welcome to the training.

After finishing this certification process, you'll be recognized as having an extremely sought-after skill set.

Rockstar status in the world of business.

The frontier of efficiency meets ROI.

Everybody wants AI. And they want it N.O.W.

And this training is your vehicle to an exciting role at the apex of business growth proficiency.

Although technical topics are covered, this certification is designed to train individuals whose role will be to develop an AI Business Strategy, drive the implementation of the strategy through internal teams and/or vendors, and get results.

You don't need to know "tech." You need to know how to help companies get what they want from their business when it comes to AI.

This is a comprehensive course on that topic, an ever-updated library of strategic and tactical expertise on how to be an unmatched accelerant to a business's growth.

Now, as you go through the training, keep in mind the "Who, not How" concept. Just because you learn something doesn't mean you have to be the person who does the work. What this means for you is that if there's a particular part of the CAIO spectrum of duties that you aren't interested in or comfortable doing, you'll be supported by our large network of preferred vendors who can be the bandwidth or knowledge base you may need on some of your projects, and if desired, who can handle pieces (or all) of a project from the AI Business Strategy you'll be working on.

You can be the mechanic doing all the parts, which is fine, or you can assemble and manage the vendors and leverage a team as you direct them on the goals of the strategy.

To put it simply, you don't have to do this alone.

Understanding the Basics of AI, Machine Learning, and Deep Learning

In this section, we will familiarize you, through real-world applications in a business context, with the baseline knowledge you will need to participate intelligently in the AI conversation taking place around the world.

First, let's make sure you have a foundational understanding of AI and its role in a business.

Discovering the "Why" of Artificial Intelligence (AI)

In our world, where technology and progress go hand in hand, AI isn't just another buzzword.

A simple definition of AI is teaching machines to act like humans … to perceive, learn, reason, and even correct errors.

AI is all about developing intelligent machines to create systems that can imitate human thinking and behavior. But, since we are focused on AI's business applications, in this module we're not going to spend a lot of time on the technical "how" of AI. Instead, we're going to focus on the "why."

At this stage of AI capability, you're most likely to find scenarios where a human, augmented by AI, is the best solution for the use cases you'll encounter.

To start, you shouldn't view the goal of AI as trying to make our machines more human — the goal of AI in business is to **make our human tasks more manageable**.

We're teaching machines to recognize patterns, automate our tasks, reduce errors, and enhance efficiency. But the true "why" is not in these tasks themselves.

The "why" for AI is in the journey toward improved outcomes for most business functions, a better customer experience, and increased profits.

Let's consider a real-world example that we're all familiar with. In e-commerce, AI is frequently used to create personalized product recommendations based on your past shopping behaviors and the shopping behaviors of others who have bought that product before.

An example most of us can relate to is Amazon and their recommendations for additional products that their AI predicts you may be interested in. Yes, it enhances our user experience, but it also boosts sales. In Amazon's case, it increases customer spending **by about 30%, according to the latest reports.**

As we progress through this training, we'll be addressing real-world applicability and the context for our business scenarios. Let's dive in!

Understanding the Levels of AI

Now that we've established a general understanding of what AI is, let's delve a little deeper and talk about the different levels of AI that you'll be hearing about, including:

- Artificial Narrow Intelligence (ANI),
- Artificial General Intelligence (AGI),
- and Artificial Superintelligence (ASI).

Artificial Narrow Intelligence (ANI)

This level of AI is our primary focus for this certification, as it is being widely used already in business and it's the type of AI that we already interact with on a day-to-day basis.

It's AI that is specialized to perform a specific task very well, like digital voice assistants (Siri & Alexa), image and speech recognition (Google Translate), AI powered chatbots, and predictive analytics.

In businesses that are applying AI best practices, *ANI is being used to streamline operations, enhance the customer experience, and drive innovation.*

Here are 4 examples of ANI

1. Customer Service Chatbots

You have likely interacted with customer service chatbots on various websites. These chatbots are programmed to answer specific questions, guide you through troubleshooting steps, or even help you place an order. They are good at this particular task, but you can't expect them to be able to handle complex CS issues.

2. Email Spam Filters

Ever wondered how your email provider knows which emails to send to your spam folder? It's ANI. Email spam filters are programmed to identify the common characteristics of spam emails and filter them out from your inbox.

3. Credit Scoring

You might be able to thank AI for all the credit card offers you get! In the financial industry, AI is used to determine credit scores by analyzing a person's financial history and behavior to predict their creditworthiness.

4. Ad Targeting

Have you ever wondered how social media platforms like Facebook or Instagram seem to show you the "right" advertisement at the "right" time? This is ANI at work, analyzing your preferences, likes, and behavior to deliver targeted ads

Remember, these are all examples of Narrow AI designed to perform specific tasks. The more data these systems are provided, the better they become at performing their tasks. However, they cannot operate outside of their specific functions.

Artificial General Intelligence (AGI)

This type of AI would be able to *understand, learn, and apply knowledge across a wide range of tasks at the level of a human being.*

An AGI would be capable of doing many things a human can do — from managing the scheduling for a large enterprise, to writing a quarterly report, to conducting complex business negotiations.

However, it's important to note that Artificial General Intelligence (AGI) doesn't exist yet in practical applications, but is still a term you will encounter in discussions on AI applications.

Artificial Superintelligence (ASI)

This level of AI is **hypothetical** and would *surpass the most capable human minds in practically every field*, including scientific creativity, general wisdom, and social skills.

To give you an idea of ASI, think of a system that could perform a billion computations a second, predict stock market movements with high precision, and invent new business models that revolutionize entire industries.

As previously stated, keep in mind that Artificial Superintelligence (ASI) is currently a **theoretical concept**, and we are far from realizing it. The examples provided are purely speculative and futuristic.

Understanding Machine Learning and Its Business Applications

Now, let's review **Machine Learning** or **ML.**

The concept of machine learning (ML) is the process by which computers learn patterns from data without requiring human intervention. As the ML algorithm becomes more familiar with the patterns, it improves its accuracy on what decision it should make with the data as a result.

Think of ML as teaching a child to differentiate between cats and dogs. You'd show the child several images of cats and dogs. Over time, the child would start recognizing the features of each animal.

Machine learning operates similarly. You feed the system (algorithm) a ton of data (say, images of cats and dogs), and it starts learning features distinguishing one from the other.

So what does this have to do with business?

A lot.

Consider an e-commerce business, like the ones we all shop from on Amazon. They might use ML to predict the demand for a specific product.

This prediction can help the business to **manage its inventory 20% more effectively** by making sure it is keeping up with demand for its best-selling products and reducing orders for products that aren't selling as quickly.

Not earth-shattering stuff, but these things matter … and these things quickly stack up to add major value to a company.

Without getting too far in the weeds, let's break it down with **business-specific examples** for each type of **Machine Learning**

- Supervised Learning,
- Unsupervised Learning,
- and Reinforcement Learning.

Supervised Learning

In supervised learning, the model is trained on a **labeled dataset**; that is, a dataset where the correct answer (output) is known for each example (input).

Example: Customer Churn Prediction

A telecom company can use supervised learning to **predict whether a customer will churn** (cancel their subscription) based on features like the number of customer service calls, international plan, voicemail plan, etc.

The model is trained on historical data where the outcome (whether the customer churned or not) is known. It can then predict the outcome for current customers based on their features, and **prepare alternative downsells or upsells** based on this prediction.

Unsupervised Learning

In unsupervised learning, the model **finds patterns in an unlabeled dataset**, where the correct answer is not known. It's like asking the model to explore the data and find some structure within. Using tools like **GPT Code Interpreter** makes this possible, which you'll learn about in upcoming lessons.

Example: Customer Segmentation

An e-commerce company can use unsupervised learning for customer segmentation. Here, the model clusters customers based on their features like purchase behavior, demographics, etc.

The goal is to **find hidden patterns**, such as specific groups of customers who have the highest cart value or lifetime value (LTV), which can then be used to tailor marketing strategies to target more customers who fit that profile.

Reinforcement Learning

Reinforcement learning is a type of machine learning where an AI agent learns to make decisions by taking actions in an environment to **maximize some type of reward** or cumulative reward.

Example: Inventory Management

A company can use reinforcement learning to **manage its inventory**. The model learns over time the best actions to take (when and how much to order) to minimize costs and prevent stockouts. It makes decisions based on the state of the inventory (how much stock is left), takes actions (orders more stock or not), and receives rewards (cost savings).

The most common use cases for ML in business fall under the Supervised and Unsupervised learning models. Below are some examples to help you distinguish between the two.

Use Case	Supervised Learning	Unsupervised Learning
Customer Behavior	Predicting whether a customer will buy a product based on past purchase history.	Segmenting customers into different groups based on purchasing habits without predetermined labels.
Fraud Detection	Predicting if a transaction is fraudulent based on labeled examples of legitimate and fraudulent transactions.	Detecting unusual patterns or anomalies in transaction data to identify potential fraud without labeled examples.
Recommendation Systems	Recommending products to users based on their past behavior and feedback (e.g., movie ratings).	Recommending products based on similar customer behaviors or product clustering without explicit user feedback.
Sales Forecasting	Predicting future sales based on historical sales data and associated features (like promotions, holidays).	Finding patterns or associations in sales data to identify product bundles without knowing which items are typically sold together.
Marketing Campaigns	Predicting the success of a marketing campaign based on features like budget, channel, and past campaign outcomes.	Segmenting the market or audience based on behaviors or demographics to create targeted campaigns without predefined categories.

These are just a few examples of how machine learning techniques can be applied in business. Each has its strengths and is suited to different types of tasks and data.

In the context of **AI strategy**, as a CAIO, you will **assess which techniques are most relevant** to a company's strategic and tactical needs and available data to work with. More on that in the Level 2 training later in the course.

What Is Deep Learning (DL) and Its Application to Business?

Deep learning is a type of ML that uses neural networks patterned after the human brain to learn from data and make decisions like a human would.

Where traditional ML algorithms might be stymied by the amount of processing required to extract useful information from huge datasets, this is where deep learning excels.

Now, let's talk about the **3 main advantages of DL over ML**, and its applications in business:

1. Handling unstructured data

Traditional ML methods often struggle with unstructured data (such as images, audio, and text), but deep learning thrives on it. Deep learning algorithms can learn from raw data directly, making it incredibly versatile.

2. Improved accuracy

With sufficient data and computational power, deep learning models can outperform traditional ML models in tasks like image and speech recognition, natural language processing (NLP), and more.

3. Scalability

As data volumes grow, deep learning models continue to improve. They don't plateau as quickly as other machine learning models, meaning they can continue to learn and evolve with your business.

How Do We Use Deep Learning in Business?

Customer Service — Chatbots and Virtual Assistants

Deep learning can power more sophisticated AI chatbots and virtual assistants, like the ones found in our CAIO Co-Pilot software. These digital helpers can understand customer inquiries made in natural language and provide appropriate responses, delivering a seamless customer experience that may be hard for the user to distinguish from an actual human response.

Sentiment Analysis

In marketing, deep learning can be used to analyze social media feeds to determine general sentiments about products or brands, allowing businesses to eavesdrop on the conversation taking place in the market and react accordingly.

Fraud Detection

In the financial industry and in high transaction volume environments like e-commerce, deep learning can be used to detect suspicious activity and potential fraud by recognizing patterns and anomalies in transaction data, saving billions for businesses of every size.

Personalized Recommendations

In retail, deep learning is used to provide personalized product recommendations based on a customer's past browsing and purchasing behavior, helping to increase sales and improve customer experience. Remember Amazon?

Demand Forecasting

Deep learning can be used to forecast demand more accurately by considering a wider range of factors and recognizing complex patterns in the data, allowing for data-driven decision-making.

The Chief AI Officer (CAIO)'s main responsibility is to identify potential use cases for AI in the organization that are in alignment with the company's AI Business Strategy, and deep learning is an important tool in that effort.

Introducing the Power of Large Language Models (LLMs)

At this point in your self-directed pursuit of learning more about AI, you've probably come across the term Large Language Model, more commonly addressed as **LLMs.**

You may already be familiar with LLMs that have been trained on all internet data, like Meta's Llama 2, OpenAI's ChatGPT, Google's Bard, and Anthropic's Claude.

In simple terms, Large Language Models (LLMs) are like highly intelligent assistants that have been trained on massive amounts of text data. They understand language patterns, meanings, and context, allowing them to generate human-like responses and create coherent written content.

Though LLMs can perform like highly intelligent assistants, just like any new employee, they have to be "trained" to have the full context of the landscape in which their power can be utilized best.

LLMs are created by teaching computers to analyze and understand vast amounts of text data, like a company's PR communications, financial data, customer service chat logs, corporate brand identity, and marketing reports, to name a few.

They learn the patterns and meanings of words and sentences, enabling AI to generate human-like responses and write coherent content using the information it has been trained on.

And once trained, LLMs offer remarkable potential for any company.

They can draft reports, emails, and even marketing materials with impressive natural language.

They can provide instant answers to customer queries, simulate conversations, and help in data analysis in different departments by extracting insights from textual information.

All of which you'll be trained on throughout this course.

In essence, LLMs contribute by helping businesses communicate more effectively, streamline tasks that involve language processing (which is most jobs), and level up their automation of tasks that would otherwise require extensive human involvement.

LLMs in Action: Real-world Business Scenarios

Here are some examples of how businesses are benefiting from using LLMs:

Elevated Communication Efficiency

Imagine having an AI-powered assistant that can draft emails, reports, blog content, social media posts, product descriptions or other written content with remarkable accuracy and coherence.

LLMs possess an innate understanding of language nuances, enabling them to craft messages that sound as if they were written by a human. This capability not only saves time but also ensures consistent and professional communication across the organization.

Instantaneous Customer Engagement

One area where we see a lot of demand is in supporting Customer Success efforts within a company.

When trained on a company's Customer Success data, LLMs have the ability to provide instant responses to customer queries around the clock, enhancing customer experience and customer service efficiency and reducing the need for a large CS team. This is a department that usually experiences high turnover, so effectively deploying this tech reduces the need for recruiting, hiring, onboarding, and training a Customer Success team.

Personalized Marketing Content

The more personalized a marketing effort is, the better the results when compared to less personalized marketing messages.

Tailoring marketing content to individual preferences is a key strategy to boost engagement and increase sales conversions.

LLMs can analyze vast amounts of customer data and generate personalized marketing messages that resonate with specific customer segments within a company. From email campaigns to social media posts, LLMs help businesses deliver targeted content at scale.

Data Analysis and Insights

Every company has actionable intel hidden in its data … it's the old "can't see the forest for the trees" scenario. They have plenty of data points that could be used to optimize areas of the business but don't have the process or the bandwidth to do a deep dive into data.

Analyzing vast amounts of textual data is exactly what LLMs are for.

Businesses are using these models to sift through documents, reports, and online content to identify patterns, sentiment trends, and emerging topics, providing businesses with a deeper understanding of their market and audience and allowing them to make data-driven decisions.

Enhanced Automation and Productivity

Automation within a company's processes is one of the bigger, easier wins when using AI. Automation is at the core of LLMs' capabilities.

These AI models can automate routine tasks like content generation & posting, data summarization, report creation, and even preliminary research.

By offloading such tasks to LLMs, businesses can free up valuable (and costly) human resources for more strategic and creative endeavors that require a human in the loop.

Multilingual Capabilities

This usage of AI is pretty cool and has been an initiative of our own CAIO recently.

For global businesses, or those looking to expand beyond their borders, you gotta speak the language.

We are using LLMs to seamlessly translate content accurately and rapidly into different languages, allowing us and many other businesses to reach diverse audiences and expand our market reach.

From translating product descriptions to localizing marketing campaigns, these models enable businesses to effectively communicate with international audiences.

Legal and Compliance Document Review

In the legal sector, LLMs are transforming document review processes.

These AI models can analyze contracts, legal documents, and regulatory texts to quickly identify critical information and potential risks to your company.

By automating this traditionally time-consuming task, the legal department can allocate more time to strategic analysis and decision-making.

Starting to get it?

These real-world scenarios highlight the versatility and undeniable impact of Large Language Models across businesses.

As a future Chief AI Officer, understanding these applications will be crucial for strategically integrating LLMs into any organization's operations, driving innovation, and staying competitive in the evolving business landscape.

Generative AI in Business

This is the application of AI that most users have exposure to. Generative AI is a type of artificial intelligence that can generate new content, such as text (ChatGPT), images (Midjourney), or music (OpenAI's Jukebox).

This tech is rapidly developing and improving and has the easiest application for some quick wins.

Some examples of how Gen AI is being used by some familiar brands:

Creating personalized marketing materials, such as emails, landing pages, and social media posts.
As referenced earlier, Amazon uses generative AI to create personalized product recommendations for its customers, generating an additional $3 billion in revenue each year.

Generating new product ideas and designs.
Using Gen AI for ideation is how Google designs new products, such as the Pixel phone and the Nest smart home products.

Improving customer service by creating chatbots that can answer questions and resolve issues.
Facebook uses generative AI to create chatbots that can answer customer questions and resolve issues that are most commonly encountered, saving millions in CS labor.

Detecting fraud and other threats.
Bank of America uses Gen AI to detect fraudulent transactions and estimated that generative AI has helped it to prevent $1 billion in fraudulent transactions each year.

Developing new business models.
Uber uses it to create new ways to deliver transportation services and estimated that generative AI has helped it to increase the number of rides taken by 10%.

Yes, these are all well-known brands, but regardless of the size of your company, you will learn how to do all of these things and more. Gen AI has a very low barrier to application once you know what you're doing!

If you're interested in a more technical understanding of these concepts, we've provided some links in the Additional Resources section. Since the focus of this certification is in regards to business application, we're intentionally keeping the "geek speak" — aka technical talk — to just the basics.

So here's a recap of the **key terms** from this lesson … you'll encounter them throughout the rest of the training:

Artificial Intelligence (AI): The ability of a machine to imitate intelligent human behavior and perform tasks like sensing, comprehending, acting and learning.

Machine Learning (ML): A subset of AI focused on algorithms that can learn from data to make predictions or decisions without explicit programming.

Deep Learning (DL): A type of advanced machine learning that uses neural networks modeled on the human brain.

Neural Networks: Computing systems modeled on the neurons in the human brain that can learn and make decisions.

Unsupervised Learning: A type of ML algorithm that finds patterns in unlabeled data with no pre-defined output.

Supervised Learning: An ML algorithm trained on labeled data containing the desired output.

Reinforcement Learning: An ML technique where agents learn to optimize behavior in an environment based on rewards and penalties.

Narrow AI: AI focused on performing a singular task extremely well. Most business applications today.

Artificial General Intelligence (AGI): Hypothetical AI with the ability to learn and apply knowledge to any problem at human levels.

Large Language Models (LLMs): AI trained on massive text data to generate human-like language.

Generative AI: AI that can generate new content like text, images, video, music, etc.

AI Strategy: Developing plans to leverage AI tools to achieve business goals. Chief AI Officer role.