

# Emerging Technology for Business Leaders



# Table Of Contents

Understanding AI Language

Interact With your customers

Fast Automated Decisions

Make Accurate Decisions

See Pattern

Seem More Human



# Understanding AI Language

We will explore some high level concepts:

- Machine Learning
- Artificial Neural Networks
- Deep Learning
- Natural Language Processing

---

## Ai systems are used to:

Better interact with customers

Identify new markets

Predict inventory

Make real-time decisions





# NATURAL LANGUAGE PROCESSING

Natural Language processing (NLP)

Allows Artificial intelligence systems to read & write using natural language.

IT CONSISTS OF 3 MAIN COMPONENTS:

**Natural Language Understanding (NLU)-**  
Allows the system to read

**Natural Language Generation (NLG)-**  
Allows the system to write.

**Automatic Speech Recognition (ASR)-**  
Machines identify spoken words and converts it to text.

# USES:

1

**Customer service:** NLU allows you to read incoming messages. NLG allows you to write an appropriate response.

2

**Marketing and sales:** NLP can be used to analyze customer feedback and social media data to identify trends and opportunities, and to develop more targeted marketing campaigns.

3

**Product development:** NLP can be used to extract insights from customer reviews and support tickets to identify areas where products can be improved.

4

**Market research:** NLP can be used to analyze large volumes of text data from sources such as social media, news articles, and product reviews to gain insights into customer sentiment, market trends, and competitor activity.



---

# NLG-THE SUPER POWER SEARCH ENGINE

Computers see writing as a **Data Challenge** by *looking for patterns in data.*

NLG works well when combining data from many different sources

## **TOP USES:**

PRODUCT REVIEWS

NEWS STORIES

WEATHER FORECASTS



---

## Understand text and speech (NLU)

NLU is the most challenging component of **Natural Language Processing** because it is difficult to teach a computer to understand human language in all its complexity.



---

## Responsive automated customer service

- NLG is a powerful tool that can be used to improve the customer support experience in a number of ways.
  - a. Breaks down customer questions into keywords and searching databases, forums, and product catalogs for answers.
  - b. Used to generate additional information based on the keywords in the customer question



---

## Review the top NLG tools

- You can buy natural language understanding (NLU) tools from software vendors or build your own systems with open-source tools.
- One popular open-source NLU tool is **Natural Language Toolkit (NLTK)**- which is written in Python.



## Review the top NLG tools

- **SimpleNLG** is an open-source engine that aims to produce natural-sounding text.
- **Arria NLG Studio** is a commercial platform that focuses on taking structured data from corporate databases and combining it with natural language to describe the data.
- **Wordsmith** is a commercial platform from Automated Insights that focuses on readability.
- **Quill** is a focuses on interpreting the data.
- *The best NLG platform for your organization will depend on your specific needs.*



---

# Interact with your customer



---

## Automated Speech Recognition

Speech recognition and NLP are two different but *complementary* technologies. Speech recognition converts sound to text, while NLP understands human language. AI systems use both of these technologies to create conversational experiences and solve other complex problems.



---

## Respond with AI virtual agents

Virtual assistants combine natural language processing (NLP) with automated speech recognition (ASR) to create a conversational experience.

Virtual assistants are a powerful tool that can be used to improve customer service, automate tasks, and gain insights into customer behavior. However, it is important to choose the right technology and build a system that is tailored to your specific needs.



---

## Review the top virtual agent tools

- Microsoft's Chatbot uses a "gooey" to create a map of questions and potential responses.
- Artificial Solutions' Teneo platform uses a series of algorithms to enable natural language interaction.
- DigitalWorkforce.ai offers a digital assistant service instead of focusing on building chatbots.



---

# Fast Automated Decisions



# AI Automated Decision-Making

Automated decision-making is a powerful tool that can help businesses improve their efficiency and customer service, without human intervention.

Works best when it has access to **large amounts of data**.

Automated decision-making can be used to solve all kinds of business logistics challenges, such as optimizing inventory levels, routing vehicles, and scheduling deliveries.



---

## Benefit From Next-Level Logistics

Automated decision making look at more data sources and make more decisions faster.

But if you're thinking about using these tools, you should actually think about it as supplementing agents instead of replacing them.

Analytical decisions follow *predictable patterns*. They usually involve a lot of data and statistical analysis.

**Businesses should consider the specific needs of their organization and the types of decisions they need to make when deciding whether to use AI automated decision-making systems or human customer service agents.**



---

## Manage and monitor with IoT devices

AI decision-making systems work best when they have access to massive amounts of data, from both past and current sources.

- **Internet of Things (IoT)** devices are being used to gather real-time data for AI decision-making systems.
- When considering using AI decision-making systems, businesses should think carefully about what real-time data would be the most useful in their decision making.
- Businesses should also look for ways to connect IoT data sources to past trends to give their AI decision-making systems a more complete picture.



---

## Talking to your Customer

AI decision-making systems and natural language processing (NLP) can be combined to create powerful customer service tools.

AI decision-making systems can incorporate massive amounts of data to make decisions on behalf of customers, such as recommending alternative flights or products.

When combined with NLP, AI decision-making systems can communicate with customers in a way that feels familiar.



---

# Make Accurate Decisions



---

## Build Machine Learning Platforms

Natural language processing (NLP) and automated decision-making systems are both AI tools that rely on massive datasets and sophisticated pattern matching.

They use very similar concepts to accomplish these tasks, and the most popular way to develop them is by using machine learning.

Machine learning algorithms can be used to label data based on any criteria, such as keywords, phrases, or customer requests. This labeled data can then be used to train NLP and automated decision-making systems.



# It's really about labeling data

Machine learning algorithms are trained on labeled data, which is created by human operators.

- Most popular type of machine learning is **supervised learning**, where the human operator tells the algorithm what to label.
- **Unsupervised learning** is another type of machine learning where the algorithm finds patterns in the data without any human intervention.

This can be useful for finding patterns that humans haven't yet identified, such as new drugs or stock trading opportunities.



---

## Guess what customers will buy

Machine learning algorithms can be used to find patterns in data and make predictions. There are two main types of machine learning: supervised and unsupervised.

**Supervised machine** learning algorithms are trained on labeled data.

**Unsupervised machine** learning algorithms learn from unlabeled data.



---

## Answer questions before they're asked

**Supervised machine** learning requires a labeled training set, where the data is classified into different categories. This type of machine learning is good for generating accurate predictions, but it can be difficult to label all of the data.

**Unsupervised machine** learning does not require a labeled training set. The algorithm finds its own patterns in the data, which can be useful for identifying new insights or unexpected trends. However, unsupervised machine learning can be more difficult to interpret, and the results may not be as accurate as supervised machine learning.



---

## Make decisions before your competitors

Supervised machine learning can make instantaneous decisions and may be more accurate than human radiologists. However, it requires a lot of data to train the system, and it may not be able to handle new or unexpected data.

Unsupervised machine learning can identify new diseases or disorders, but it is more difficult to interpret the results, and the system may cluster together different abnormalities.



---

## Build systems with expertise

Automated decision-making systems are becoming increasingly sophisticated and are being used for a wide variety of tasks, including loan approval, hiring, and student admissions.

These systems typically use machine learning to analyze large amounts of data to make predictions. This can lead to **more accurate** and **less costly decisions** than traditional methods.



## Don't be evil

Machine learning can be used to make accurate predictions for automated decision-making systems, at a low-cost. **But it is important to use unbiased data to train these systems.**

**The ethical challenges** of automated decision-making systems are a complex and important issue. It is important to be aware of these challenges and to take steps to mitigate them.

For example, organizations can use a variety of techniques to debias their data and to ensure that their systems are fair and transparent.



# Review the top machine learning tools

Some of the most popular machine learning tools include:

- **Scikit-learn:** A free and open source machine learning library for Python.
- **Amazon SageMaker:** A cloud-based machine learning platform from Amazon.
- **Microsoft Azure Machine Learning:** A cloud-based machine learning platform from Microsoft.
- **IBM Watson Machine Learning:** A cloud-based machine learning platform from IBM.

These tools offer a variety of features and capabilities, so it is important to choose the right tool for your specific needs.



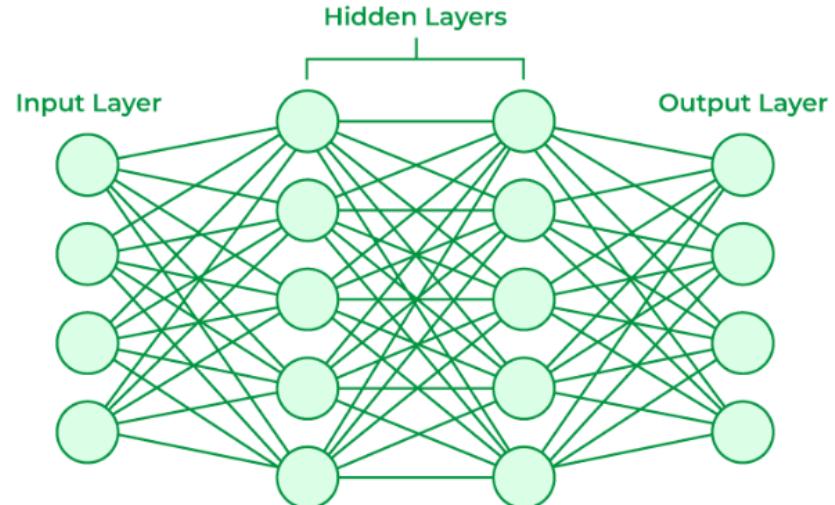
---

# See Patterns

# Build a neural network

Artificial neural networks (ANNs) can be used to solve a wide variety of problems, including machine learning tasks such as classification and clustering.

They are particularly well-suited for *processing large amounts of data*, as they can distribute the processing power to a network of individual nodes.





---

## Add layers for deep learning

Deep learning artificial neural networks (ANNs) are very powerful machine learning tools that can be used to find complex patterns in data.

They are particularly well-suited for problems where we have a lot of data and we want to predict a specific outcome.

Deep learning ANNs require a lot of data to train. If you do not have the right data, then you may not be able to achieve good results.



---

## How to cluster together purchases

Artificial neural networks (ANNs) are different from how most organizations think about computing. They learn by making mistakes and are great for **seeing associations** or **regularities in complex patterns**, especially when you have a lot of *diverse data with patterns* that are hard to recognize.

If you are considering using ANNs in your organization, it is important to carefully consider the problem you are trying to solve and the data you have available. You should also consult with an expert to help you choose the right ANN architecture and train the network properly.



---

## You can classify your best customers

A credit card processing company used machine learning to analyze customer data and recommend promotions based on their interests.

They used a combination of unsupervised and supervised machine learning to cluster customers into groups based on their spending habits and then classify them into different labels, such as "flexible and open to new experiences" or "tend not to like new foods or restaurants."

They then used these labels to micro-target the very best customers for specific promotions.



---

# Review the top deep learning tools

Deep learning tools are a subset of machine learning tools that specialize in creating deep learning artificial neural networks.

Some popular deep learning tools include:

- **TensorFlow**: An open source end-to-end machine learning platform that can be used with most cloud-based services.
- **Keras**: A Python library that sits on top of TensorFlow and is a very popular way to work with training data in TensorFlow.
- **Microsoft Cognitive Toolkit (CNTK)**: Another open source deep learning framework that is part of the Open Neural Network Exchange (ONNX).
- **Caffe**: A deep learning framework developed by Berkeley AI Research (BAIR) that is particularly well-suited for object identification.



---

## Which tool to choose:

When choosing a deep learning tool, it is important to consider the following factors:

- **The type of deep learning task you want to accomplish.**
- **The programming language you are using.**
- **Your budget.**
- **Your experience with deep learning.**

If you are new to deep learning, it is recommended that you start with a tool that is well-documented and has a large community of users. This will make it easier for you to get help and learn from others.



---

# Seem More Human



---

## Check body language with biometrics

Biometrics are distinct, measurable characteristics that can be used to identify individuals. (They can include fingerprints, DNA, voice patterns, facial features, and more).

Biometric data is becoming increasingly important in our world. It is used in a variety of applications, including security, healthcare, and customer service. As machine learning algorithms become more sophisticated, we can expect to see even more innovative uses for biometric data.



---

# What's automated or "intelligent"?

AI systems can **learn** and **grow**, while automation systems simply **follow pre-programmed rules**.

AI is a powerful tool with the potential to revolutionize many industries. However, it is important to use AI responsibly and ethically.

When evaluating AI products, ask yourself the following questions:

- *Can the system learn and grow?*
- *Is the system transparent and accountable?*
- *Is the system aligned with my values?*