Synapse
Search

Machine Learning

**Intelligent Connections:
How Machine Learning is
Revolutionizing Marketing**

Contents

Synapse Search

Machine Learning

A revolution in marketing
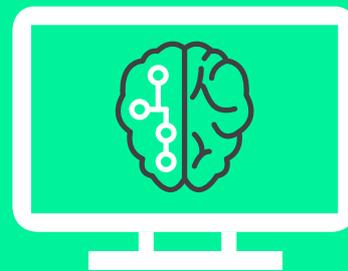
There's a revolution going on in the marketing world. You might have heard of it. It's called machine learning.

As computing has evolved over the last half century, our machines have gradually increased their capacity and improved in their ability to process ever-expanding volumes of data.

Over that same 50-year timeframe, marketing as a business discipline has also evolved.

Today, those datasets are now so large that we need artificially intelligent machines to help us make sense of them.

Today, we are at a point where the twin evolutionary paths of computing and marketing are converging in revolutionary ways; specifically, machine learning and marketing automation.

With the insights and robust analytics that machine learning can generate, marketers can:
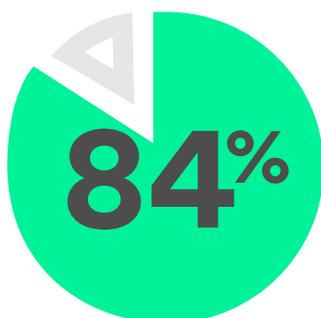
1 better understand their sales prospects and what is driving qualified leads

2 improve the precision of marketing campaigns through personalisation and tailored content

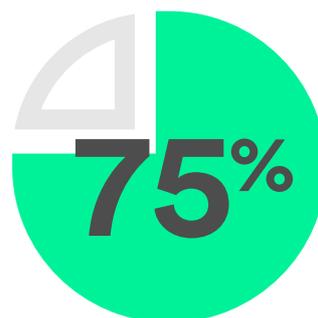**3** manage pricing – and profitability – more effectively

4 identify and solve problems faster

5 forecast sales with greater accuracy

84% **of marketing organizations** are implementing or expanding AI and machine learning in 2018

75% **of enterprises** using AI and machine learning enhance customer satisfaction by more than 10%

View source

Synapse Search

Machine Learning & AI – A Brief History

**Over the last 50 years, Artificial Intelligence has been the 'Holy Grail' of computing.**

Unfortunately, it has also been the subject of much misunderstanding, thanks mostly to its depiction in Hollywood movies as robots running amok or computers turning on their human creators.

The reality of AI, and its potential, has got lost in this confusion. The fact is that intelligent technology, with all its complexity, is simply a business tool – and one that more and more businesses today are utilising successfully.

AI today is about complementing a business's processes, rather than disrupting them.

Essentially, machine learning gives you the ability to analyse more data and solve more complex problems, and thereby help marketers make better decisions.

However, there are still many challenges to the technology. After all, a computer is only as useful as its programmer can program it. Machine learning still has limitations, but ultimately the biggest roadblock is adoption.
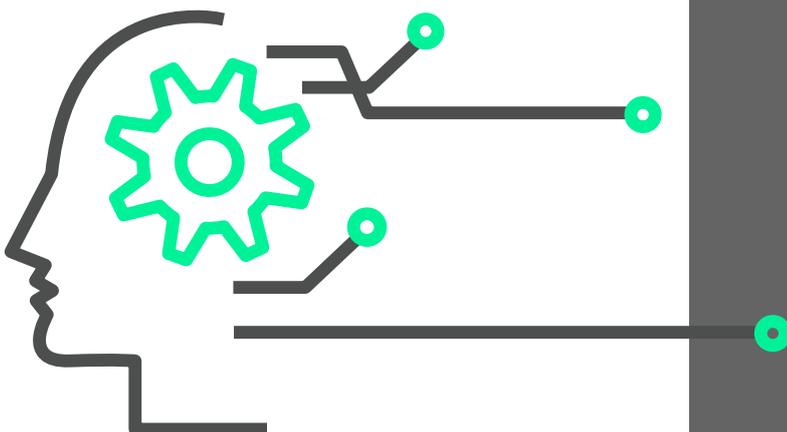
Notable moments in Machine Learning history

1940s
Alan Turing creates his electronic calculating machine to decode signals from Germany that helps the Allies claim victory in WWII. In 1950, he proposed the Turing test as a measure of machine intelligence – a test still used today.

1950s
In 1959, Arthur Samuel, an American AI pioneer, coins the name 'Machine learning', defining it as "the field of study that gives computers the ability to learn without being explicitly programmed."

1960s
The Turing Award for computing is established in 1966. Future recipients will include Edward Feigenbaum for his pioneering work in AI, and Tim Berners-Lee for inventing the world wide web.

1980s
The Internet is established and becomes publicly available at the end of the decade. Yoshua Bengio begins research on deep learning through a joint academic initiative in Montreal, Canada.

1990s
An IBM designed machine, Deep Blue, beats chess master Garry Kasparov in 1996.

2000s
Deepstack's AI beats professional human poker players and Google's AlphaGo AI beats the world's best human player, Ke Jie, in 2017.

2010s
This decade sees the dawn of big data, bot-to-bot marketing, speech and image recognition, and self-driving cars, among other innovations powered by AI and machine learning.

Real-Life Examples of Machine Learning

The real world of machine learning is more familiar than you might realise. Here are some examples of machine learning and AI that you're probably using right now.

Adapted from: **view source**
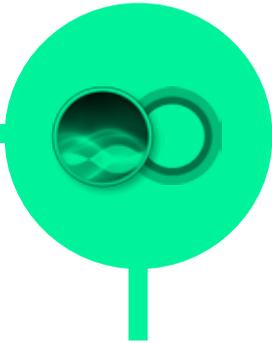
Siri and Cortana

Voice recognition systems such as Siri and Cortana use machine learning and deep neural networks to imitate human interaction. As they evolve, these apps will learn to 'understand' the nuances and semantics of many different languages.
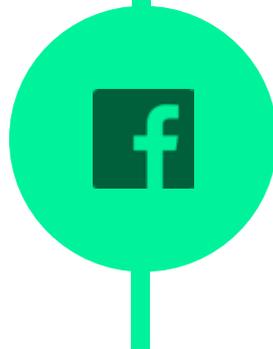
Facebook

The world's biggest social network is now using AI algorithms to recognise familiar faces in photos you post to your Facebook page. The software, called DeepFace can recognise the differences in human faces with a 97.25% degree of accuracy – only 0.28% less than an actual human being.

Google Maps

Google introduced machine learning to Google Maps in 2017. These deep learning algorithms help the app extract street names and house numbers from the more than 80 billion hi–res photos taken by Street View cars which increases the accuracy of search results.

Google Search

The world's most popular search engine now offers recommendations and suggestions based on previous user searches. In 2015, Google introduced RankBrain – a machine learning algorithm used to decipher the semantic content of a search query. **(See page 7 for more)**.

Gmail

In 2015, Google introduced a smart reply function to Gmail based on two recurrent neural networks that decipher the meaning behind the incoming message and automatically suggest three different responses.

Synapse Search

Netflix

More than 80 percent of TV shows on Netflix are found through its recommendation engine. Machine learning is integral to this process, as the platform analyses user behaviour and programme content. These datasets create multiple 'taste groups', which tell the recommendation engine which programmes to serve up.
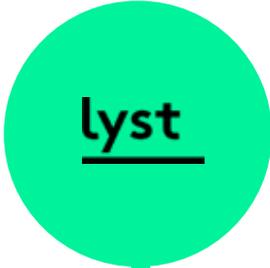
PayPal

By implementing deep learning techniques, PayPal analyses vast quantities of customer data and evaluates risk efficiently to detect and combat fraud.

Uber

Machine learning is a fundamental part of the Uber model, which uses algorithms to determine arrival times, pick-up locations, and UberEATS' delivery estimations.

Spotify

Spotify uses machine learning to figure out your likes and dislikes and provides you with a list of related tracks. Songs are 'hand-picked' by machine learning algorithms, which analyse user activity and match your tastes to music with similar meta-tags.

Lyst

Lyst is an e-commerce fashion site that uses machine learning to match customer searches with relevant recommendations. Lyst uses meta-data tags to make visual comparisons between items of clothing, and their algorithms then read these tags and decide on the best matches.

"**Machine learning is the field of study that gives computers the ability to learn without being explicitly programmed.**"

– Arthur Samuel, AI pioneer, 1959

Google RankBrain

RankBrain is a machine learning (AI) algorithm that Google uses to sort the billions of search results entered into its engine every day.

In the bustling world of search advertising, where campaign managers balance their time between creatively building campaigns, and mechanically managing and updating them on a daily basis, marketers are once again spending most of our time filling a role that makes more sense for a machine.

Google has publicly stated that RankBrain, its machine learning, artificial intelligence system that is used to help process search queries, is now the third ranking factor in search engine results rankings.

First unveiled in 2015, RankBrain was a new way of finding search results which took an 'interpretation' approach, rather than simply locating exact matches to certain words or phrases. By taking into account over 200 possible factors associated with the search words, RankBrain could better identify the true intent of a query – thus producing more relevant results.

If RankBrain encounters an unfamiliar word or phrase, its algorithms consider the various meanings of those words and make a guess as to what the searcher might actually be looking for and presents back these filtered results. In other words, by trying to understand what someone is really asking for, RankBrain helps Google's search engine think more like a human.

However, the second part of RankBrain's process is where things really get interesting. After the algorithm has presented its results, it measures how people interact with those results – such as how long they stay at the destination site or whether they backtrack – effectively working as a user satisfaction tracker. If the user didn't like the result, the algorithm takes note of this for the next search and tries another meaning. If they do, it pushes that result up the rankings.

A notable effect of such an algorithm is that it makes Google much more effective at handling never-before-seen search queries or keywords – and there are plenty of those; about 15% of all search queries were unfamiliar to Google when it first started using RankBrain.

Synapse
Search

Types of Machine Learning

One of the most commonly used definitions of Machine Learning describes it as "the technology that gives the ability to computers to learn without being explicitly programmed."
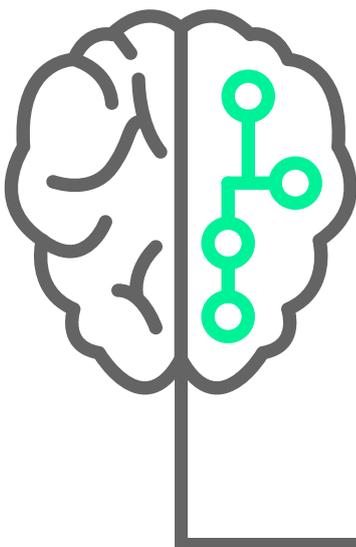
Artificial Neural Networks

The last few years have seen an explosive growth in Machine Learning technologies. The availability of large datasets accumulated in the years of Big Data finally found its match in increased computing power and advances in Artificial Neural Network design that brought successful Machine Learning solutions to problems previously deemed too complex for machine intelligence.

Deep Learning (AKA Deep Neural Networks)

Techniques such as Deep Learning (or Deep Neural Networks) make use of huge datasets to achieve near human (or better) performance in facial recognition, image classification, voice recognition, or mastery of such games as chess, poker, and go.

Artificial Intelligence

Artificial Neural Networks and Deep Learning have been heralded as great examples of Artificial Intelligence (AI), intelligence exhibited by machines. But viewed from the angle of the Turing test these "narrow AI" applications would not fool any human; they can only exhibit the behavior of their chosen specialty. An ML system that excels at chess cannot recognize faces any better than a voice recognition system can play go. Furthermore, these systems suffer from "catastrophic forgetting". Once they master a specific task, learning a new one would mean they completely forget the previous skill.

Inside Machine Learning

Machine learning as a concept came about through research into AI, and the approach that machines could 'learn' through processing large sets of data, directed by humans for a specific purpose.

As distinct from computer programming, which is a process of giving specific data commands that are then followed, machine learning can be better described as 'tuning', or 'curating' data around particular models or techniques.

The machine learning technique used to solve a problem depends on the question being asked. These techniques can be classified into three broad categories:

Supervised Learning

The computer is given curated, labelled data where both inputs and outputs are available, and the computers task is to map the differences between the known inputs and outputs. Examples of this include computers tasked with identifying and separating real news stories from fake news, or the famous example of Google's AI which could detect videos that have cats in them.

Unsupervised Learning

In contrast to supervised learning, with unsupervised learning, no labels are given for the input data. The computer's goal is to find some structure in the data. A real-life example of this is Google News, where a variety of published articles are grouped together based upon their content and put in front of the user.

Reinforcement Learning

Reinforcement learning uses a 'reward and punishments' mechanism to teach the computer how to perform a certain goal. The best analogy for describing it is a lab rat experiment where the rat learns to find a path through a maze that leads it to a block of cheese. This technique is used in AI systems that can play games of chess.

Synapse Search

Machine Learning & Marketing

Why AI Marketing Matters Today More Than Ever Before
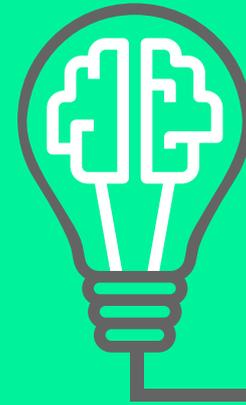
Just like computing, marketing as a business discipline has evolved and changed over the 250 years since it was first understood to be a core part of an organisation's business objectives for success..

Like the computing industry, marketing theory and practice has not stood still. Methods that may have been seen as cutting edge even a decade ago are all but irrelevant in today's hyper-connected world.

Advertising especially faces ever-increasing challenges with cut-through in the online environment. In paid spaces, ad blocking and fraud are major barriers, while unpaid channels like email – while still important – require greater energy from marketing departments and their data analysts to achieve results.

Marketing efforts by businesses today need to have a laser-focused precision on consumers, and yet the volume of data that they must engage with to do so is unprecedented in the modern market. Solutions that can ably handle such a wealth of data, find relevant patterns and make practical sense of it are needed.

Enter machine learning for marketing.

"The increase in messages sent by marketers, the priority placed on real-time interactions, and increasing expectations by consumers to receive personalized interactions and content is forcing email marketers to evolve their craft in order to get their emails opened."

– Hopkins, J., & Sarner, A. (2015, November 30). Market Guide for Email Marketing - Gartner

The 'marketing concept' proposes that to meet its business objectives, an organisation should anticipate the needs and wants of potential consumers and satisfy them more effectively than its competitors. This concept originated from Adam Smith's book The Wealth of Nations, but would not become widely used until nearly 200 years later."

Synapse Search

The Benefits of Machine Learning for Marketing

Today, machine learning and AI enabled systems are providing marketers with the data analysis capabilities they need to unlock insights into consumer behaviour and tailor personalised communication messages at an individual level.

AI can deliver customer behaviour information to marketers at levels of detail that would not have been achievable otherwise, and this information can then be integrated into appropriate marketing programs that cater to those specific consumers.

Machine learning in marketing is destined to become as integral a part of business as mobile technology or personal computing.

As algorithms glean insights on consumers through background data analysis, marketers are empowered to spend more time focusing on targeting those consumers once identified.

In short, machine learning optimises knowledge gathering for marketers. The benefits of that are obvious – knowledge provides the foundation for more effective marketing engagement.

Synapse Search

Marketing Innovation in Machine Learning

Globally, leading tech industry players are pushing forward with new innovations in machine learning for marketing.

# These include:

Einstein by Salesforce

Powered by advanced machine learning, deep learning, predictive analytics, natural language processing and smart data discovery, Einstein's AI models boast an ability for automatic customisation for individual consumers – self-tuning and increasing knowledge with every interaction and additional piece of data to predict future behaviour.

IBM Watson & 'Lucy'

Originally created by IBM as a question answering (QA) computing system, Watson applies advanced natural language processing, information retrieval, knowledge representation, automated reasoning, and machine learning technologies to the field of open domain question answering. Lucy is a "cognitive companion" built off Watson for marketing purposes, to help with persona modelling and media planning.

Google Cloud ML Platform

Google Cloud includes an artificially intelligent unit to process photos, voice search, translations and Gmail Smart Reply. It makes use of image recognition and other advanced techniques for identifying customers.

Synapse
Search
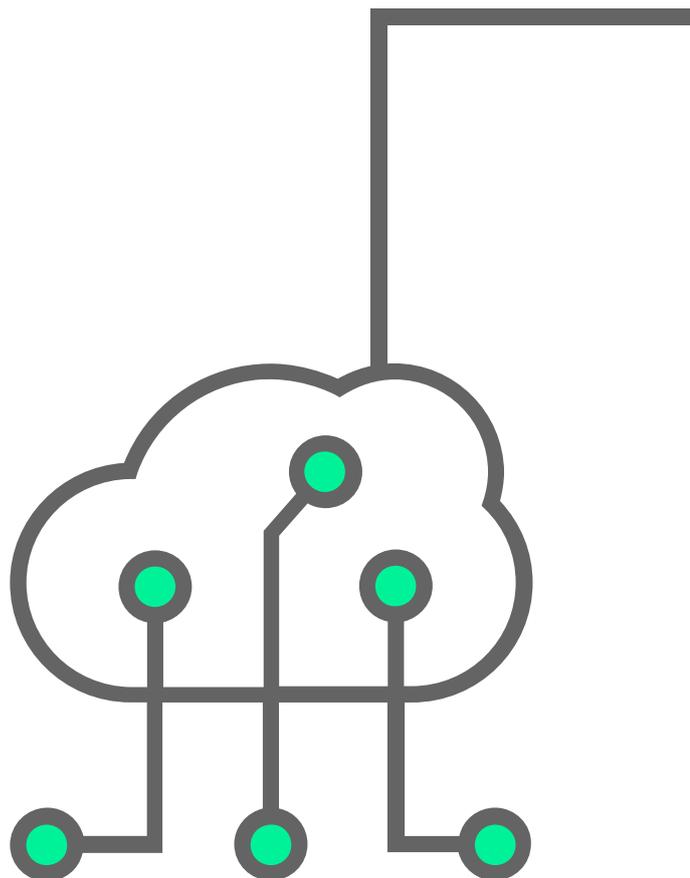
Machine Learning and Search Marketing

In the bustling world of search advertising, where campaign managers balance their time between creatively building campaigns, and mechanically managing and updating them on a daily basis, marketers are once again spending most of our time filling a role that makes more sense for a machine.

By allowing algorithm-infused machines to take the load in search advertising, marketers can focus more on innovation and honing their efforts on improving the efficiency, accuracy and effectiveness of their campaigns, as they drive towards more humanized communications and engagement.

When it comes to accuracy and performance, machine learning is playing in a whole different ballpark, and all those marketers still batting in the little leagues will find it increasingly difficult to stay competitive as their competitors leverage machine learning algorithms more frequently.

ACCURACY

| PEOPLE | BID RULES | ALGOS | MACHINE LEARNING |

PERFORMANCE
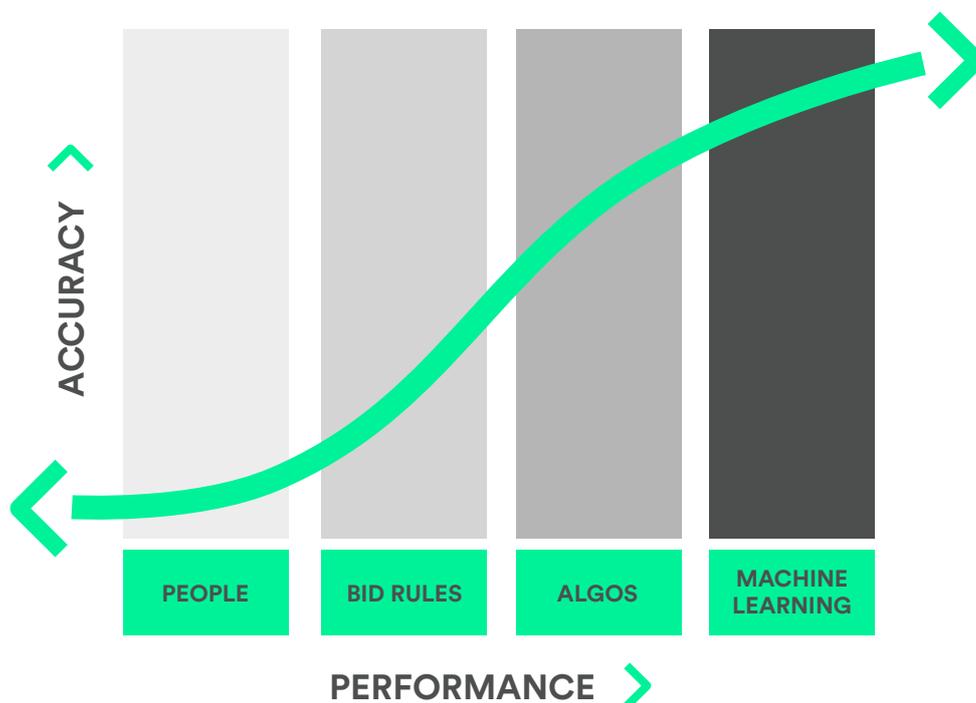
Of course, to achieve such a transformation and significant improvements in overall results, marketers need access to technological solutions that can deliver on the great promise of machine learning.

The good news is that the momentum for pushing forward these necessary shifts in technology is already well underway, and solutions are now well with our grasp.

Synapse
Search

About Synapse Search

At Synapse, we do SEARCH differently. We're on top of the latest trends, tools and techniques – and we have the results to prove it.

Synapse Search's expertise has been finely tuned through delivering SEO and Adwords campaigns for multiple brands within the Umbrellar Group, and delivering more than $20,000,000 in revenue every year.

Our Google Ads expertise is amplified by our ad management platform—powered by machine learning to increase the efficiency of your budget, maximising ROI.

We have years of experience managing AdWords budgets large and small, and now our Intelligent ad management platform allows us to stay on the forefront of the industry, always learning, smarter up to date.

The platform drives efficiencies like—10% decrease in CPC, 18% decrease in CPA, 22% increase in conversions, while we partner with you to create a customised strategy for your business.
We don't do "set and forget" approaches/a cookie-cutter solutions—we get to know your business, and craft and execute a SEM strategy to meet your unique needs.

We want to put the power of Google Ads (the power of Search) in the hands of all New Zealand businesses; we believe small, medium—really NZ businesses of all kinds—should be able to harness the power of Search!

It's not just about being found. It's about being found by the right people, in the right places at the right time. We find the right connections for your offering – not everyone else's.

Paid Search meets Machine Learning

We combine the best tech with creative thinking, to connect you to your customers, using targeted Google Ads powered by machine learning.

PLAY VIDEO

Synapse
Search