



Topic: Artificial Intelligence & Retail

What does A.I and machine learning mean? What is the difference between A.I. and machine learning? How can you implement Artificial Intelligence in your business? Find the answers to these questions in this EcommerceWiki topic.

Hosts:

Salesforce Commerce Cloud

Curators:



Luis G. Luna

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Artificial Intelligence & Retail Basics

What is artificial intelligence (AI)?

Definition of Artificial Intelligence

The term artificial intelligence was coined in 1950s. This was after the US department of Defense Advanced research Projects Agency(DARPA) took interest in this type of technology. They first started to train machines to mimic basic human reasoning and problem solving and has since then developed machines that are able to perform more intricate tasks.

In order for a system to be described as an artificial intelligence system it as to demonstrate human behaviors such as planning, learning, reasoning. Problem solving. Knowledge. Representation, perception, motion and manipulation. This can be differentiated into two sectors; narrow AI and general AI. Narrow AI means that the machine can only perform one task at a time. General AI means that machines can attempt to think and function as the human mind.

Although Artificial Intelligence is mostly known for its robotic usage, today 's artificial intelligence has a high demand in different job sectors such as health care, retail, manufacturing and sports.

What is Artificial Intelligence really?

Movies have made us believe that Artificial Intelligence is something related to science fiction, such as intergalactic travel or comic superheroes.

In other cases, they make us believe that Artificial Intelligence is a threat to humanity, making us believe that robots become rebellious or destroy their creators at some later stage... They will conquer the whole world! (Yeah right).

This naive and imaginary vision limits us and does not allow us to see what AI really is, and what it can do for us today, especially in business matters.

AI ??as an area of study

Artificial Intelligence is more than a subject for fiction films and books; It is a very serious area of ??research within Computer Science. This area has existed, in some form or another, since the first digital computer was created and has not stopped progressing since then.

Now, in the present time, we see more and more news that mention AI or every time we see more products or apps that apparently use AI. The question is, why has the interest in Artificial Intelligence surfaced recently?

The "rebirth" of AI

The resurgence of interest in Artificial Intelligence occurred in the year 2012, when a team of Researchers from the University of Toronto created an algorithm (deep neural network) that allowed to detect and identify different objects and animals within photographs with a precision much greater than other algorithms.

This new technique to detect complex patterns within the data is known as "Deep Learning", which helped to revolutionize the area of ??Artificial Intelligence that seemed to have no potential anymore, called "Machine Learning".

Although detecting objects within images does not sound like the greatest innovation in history, "Deep Learning" showed that it is possible to extract knowledge and even make complex automated decisions only by having the correct data and the correct algorithm, without the need for human supervision.

What is the difference between AI and machine learning?

One of the main differences between AI and machine learning is that **AI is defined as a system that can think for itself** and **machine learning is a system that is given data** and it should learn how to export the data by itself. This is can be done by programming algorithms.

Machine learning plays an important role in retail because it has the ability to **analyze big data** about their consumers and can personalize their responses based on their online behaviour, purchases and preferences. This can be seen on social media platforms such as Facebook and Instagram.

In ecommerce, **machine learning can be used for price optimization**. Machine learning makes it possible to determine a company's competitors' prices, demand and type of customers.

Fraud protection can also be detected with machine learning. This type of technology can also be used

for fraud protection. Machine learning detects fraud by processing the repetitive data that happens at rapid speed before transactions are made.

These two terms are often used interchangeable because one cannot exist without the other.

Once machine learning has the ability to interact with humans and make decisions by itself, it can then be considered artificial learning.

How can AI/machine learning be used in ecommerce?

Artificial intelligence in business

In terms of business and Artificial Intelligence, probably the first thing we think about are the tech giants such as Google, Facebook or Microsoft.

Although the position of these companies in their domain in the use and development of new methods of AI is evident, there are many basic methods and knowledge that any company, even small ones, can start using to get the most out of their data.

Now, it is important to make a distinction, since there are business areas dedicated to extracting value from data, areas such as Business Intelligence and Data Analysis (or Data Science, or Data Mining) focus precisely on that, and have already existed for years.

The main difference between these areas and Machine Learning is that, while those areas analyze data to deliver forecasts or graphs as a report, Machine Learning processes data with a predefined business objective to make automated business decisions.

While a data analysis allows you to know your results and make forecasts for the management of a business, a Machine Learning algorithm allows you to automate a process and make it part of the system, or even use that automated intelligence to improve your product or service.

According to the world's leading research and advisory company, Gartner, it was predicted that by 2020, 85% of interactions between costumers and retailers will happen without human interaction.

For many companies that wish to remain relevant in the industry, innovation is the answer. With artificial intelligence being one of the leading innovations in the industry there is no surprise that this technology is rapidly taking over the ecommerce industry. Below you will find three ways how Artificial Intelligence can be used in ecommerce.

• Personalized recommendations

Personalized recommendations can be enhanced artificial intelligence by choosing products that are specifically for the customer. This can be done by analysing the travel data and lodging location of a consumer to determine their needs. It can also anticipate the consumers' needs before they even know they want it. This can be done by analysing their age and style online. Amazon incorporated this method into their company and increased their sales by 29%.

• Voice Commands

Voice commands has become a recent popular form of technology. There many voice- activated assistants that are used in homes such as Google Home, Apple Homepod, Amazon echo and not forgetting the famous Siri.

This type of technology is in North Face, where customers can get help from the pods find their clothing. These pods also reply and ask questions to humans giving a similar human interaction in stores.

• Automation and robotics

Warehouse operations has been recently taken over with the implementation of robots. In Chinese based company Jd.com. Robots are solely used for tasks such as parcel sorting. Packaging and categorizing. This

has increased sales, improved customer relations and bridged a gap between personalization and privacy. Amazon has also implemented robots in their warehouse which are PrimeAir delivery drones. This has improved delivery efficiency and reduced delivery costs. These drones are able to drop off 5 pounds of packages within 30 minutes.

Artificial Intelligence for Small Businesses

How to start using AI today in your business

Now that we already know what Machine Learning is, and how it differs from other business areas, it's time to see some practical applications.

I will share 4 things that you can start doing today to use Artificial Intelligence in your business:

1. Make as many advertisements as possible

Especially if you're paying for advertising on Google or Facebook. The advertising systems of these companies are based on Machine Learning, the more variants you have in your advertising (short videos, long videos, images, testimonials, photo sequences, etc.), the easier it gets to optimize your campaigns.

At MKTi (<http://mkti.mx/>) we have managed to reduce costs by up to 80% just by trying different ad formats. If you're just getting started in the world of digital advertising, tools like AdEspresso (<https://adespresso.com/>) will help you create variants for your advertising in a very simple way.

2. Use IFTTT tools

The IFTTT (IF This, Then That) tools, despite not containing Artificial Intelligence, allow you to automate administrative processes without effort.

Platforms like Zapier (<https://zapier.com>) allow you to integrate several systems (such as Gmail, Facebook, Instagram, Calendar, etc.) with each other to create a "Pipeline" or an automated process.

You can create pipelines such as: "Every time an Inbox arrives to my Fanpage, save the record in Google Sheets, and send me an Email".

3. Learn what is "Linear Regression"

Linear regression is one of the basic tools of a statistician. It allows you to create accurate forecasts and get to know the reasons of a certain phenomenon, in business it is used mainly to make sales forecasts.

Although it requires an effort to understand and use it correctly, it is an analysis that you can perform on a simple Excel sheet. I share a link with a tutorial on how to do it:
https://www.youtube.com/watch?v=L_a8Z0BVjyM

4. Learn how to use Excel's "Solver"

Another tool that we can use from Excel to make smarter use of our data is "Solver".

Solver, unlike a Linear Regression, does not analyze data. Instead, it allows you to program your limits (for example, your inventories), your costs, prices and expected sales; With this information Solver finds a combination of the best allocation of resources to maximize your profits.

This is just an over simplified example, Solver is a very powerful optimization tool that takes time to master, but if your business is facing problems with inventories, or with the optimization of production lines, it is worth the effort to learn a little more about it. I share a link with a simple example of how to use Solver:

So, there are no excuses! Now you can also use Artificial Intelligence to boost your business.

Artificial Intelligence & Retail Advanced

How to use A.I. in Search?

Currently, only a few organizations are using AI technology to enhance their search engine rankings. AI is mostly used by the digital marketing department where they collect data on ads targeting in order to streamline campaigns and evaluate emotional values on the company's targeted market. It is believed that AI has the ability to enhance the future of **SEO** beyond the use of simple keyword phrases.

AI technology in search is differentiated into three categories, **Artificial Narrow Intelligence (ANI)**, **Artificial General Intelligence (AGI)** and **Artificial Super Intelligence (ASI)**. ANI is used for unique and specific tasks and AGI is used for achieving humanlike facts. Lastly, ASI is the name given when an AI has reached a capacity beyond acquiring the abilities of human intelligence.

ANI is used to conduct different online activities such as emailing client's junk mail filters and Google translate. **Rank Brain** has recently been the new addition to machine learning AI systems. When it comes to SEO, ANI is capable to highlight the best and most related methods for websites.

Below are three ways in which AI can be used in search:

1. Identify blogs and influencers

In order to get influencers to hit your target market, text-processing analytics can be used. This can be **Watson Analytics**, which is used to search for a company's terms in the context of natural language. This type of software can help broaden a company's net for more link-building opportunities.

Things to look at include:

- comments and social shares on posts: Do the posts get a lot of engagement?
- last publish time and frequency: Are they actively publishing new content?
- user experience and design: Is the design up-to-date and easy to use?
- social platform: Do they have a large social media following on the platforms that are used by your industry? This can be beneficial when they share your content or content that has a link to your website.
- reputation: Sometimes, individual influencers or blogs might have a strong opinion about hot topics that you might not want to get involved with (like politics or religion). Make sure you know your targets and their voices before reaching out to them.

Source : (<https://searchengineland.com/use-ai-link-building-improve-search-rankings-283150>)

2. More auction transparency.

Google AdWords is a blind auction, due to this AI and machine learning has the potential to illuminate AdWords, therefore shedding light on competitors' behavior. It does by continuously tracking and capturing paid and organic search data through good without access through AdWords. This in turn provides information on the competitors preferred **keywords and phrases**. After which, machine learning can interpret findings to predict budgets and buying strategies, just to name a few.

3. Search Engines Use AI to Create Ranking Algorithms

Search engines use AI to improve their ranking algorithms. Machines are taught to create an optimal list from a set of possible results, learning overtime from variables. An example of this is if one search engine is ranked low, it can learn from the leading search engine and then later use algorithms to bump itself to the top.

How to use A.I. in Merchandising and Product Information?

Many algorithms are being used for Product Information to sell extra items to customers, however, the technology to develop [personalization](#) in [merchandising](#) and [ecommerce](#) is growing even more rapidly.

For instance, an algorithm functioning pretty straight forward is the 'most popular' filter. This filter is continuously changing depending on which products are the most popular, and this thanks to AI. **5 main settings** of this algorithm can be **controlled**, **optimized** and also **automated**.

1. Deciding on popular products over a defined time period
2. What is the unit used to define popularity? Is it number of sales to customers, number of sold units,

number of views?

3. Type of filter applied to determine product set
4. Visitors' behavior on website and on 'most popular' filter
5. What types of product information to promote when making the 'most popular' list

Each parameter **will affect** the final list that is created under 'most popular products' and this can be done **thanks to A.I.** If a human interaction had to be added to this multi-step optimization, this would probably result in a slower and error prone process.

The fact that this setting is using A.I. allows it to be continuously updated according to these 5 parameters.

Facets and sorts on a webshop are adjusted on user behaviors, doesn't this remove an important part of the predictability from the user experience?

The industry standards as for displaying products are:

- **Color**
- **Size**
- **Price range**
- **Language** (etc)

Moreover, **AI can be used in choosing what facets and filters** to expose to the user. To do this, you have to give up a bit of predictability that you will gain back in usefulness and user experience. The criteria examined is the aggregate sales performance for the underlying product set in each filter or facet. Finally, machine learning and AI are applied to choose which facets and products are the most relevant to be shown to the user and also in what order.

What is the future of AI and merchandising?

At the moment, predictive machine-learning is being used successfully in several markets, including financial ones. A.I. is being used in marketing automations, and these two trends are facing the same issues when it comes to retailers, i.e. a lot of information but not enough people and time to act intelligently or instantly on it.

With computers becoming the main dominant force of retail, it is believed that in five years' time more than **90% of the virtual shopping experience will be automated by computers using AI-powered ecommerce optimization.**

How to use A.I. in Personalization?

E-commerce marketers cannot ignore the **tremendous innovation in the AI sector** that has the potential to **deliver more refined user experiences.**

Machine-learning working beneath the algorithms is **becoming more and more pervasive and intelligent** in synthesizing data in real time to help personalization engines to **present individualized experiences.**

In the world of e-commerce as the self-gained or third party data gets accumulated, **machine learning revolution** can enable stores to present **super-personalized experiences.**

Machine learning helps Recommendation Engines:

- To learn from businesses and customers across external and internal touchpoints,
- To create customized algorithms that constantly polish themselves to serve the business goals more successfully,

From the stream of information containing user feedback occurrences and recurrences the predictive model can learn **how the visitor/customer reacts or makes no reaction** to different recommendations. Machine learning technology helps in **identifying algorithms** performing better or worse for a certain customer segment/scenario, and able to fine-tune itself to serve more seamlessly.

As we saw enormous computing potential needed to serve recommendations for numerous customers who have to be understood first on their individual level - within milliseconds. **Content optimization on a large scale could not exist without the help of machine learning** - or it could exist on the expense of draining the resources of human workforce, and it still would be so slow that it would take days to react the customers' actions.

How to use A.I. in Warehousing?

From since the 1950s automated guided vehicles have been used in the warehousing environments. With the recent improvements in Artificial Intelligence (A.I) such as **localization and mapping**, this has allowed the guided vehicles to move across traditional manufacturing boundaries and travel between buildings. These improvements have also led to the creation of warehousing software such as **warehousing execution systems (WES)**.

Lowe's is one example of AI being used in warehouses. Their autonomous retail robots would help customers and create real-time data by scanning their inventory by looking for patterns in product and price discrepancies.

Predictive Analytics

Predictive analytics is another use for A.I in warehousing. This feature is created by IBM, which collaborated with the Weather Company so that they are able to predict the weather from newsfeeds and social media to predict likely conditions. This prediction can allow for retail owners and managers to make better strategic decisions on supply, pricing and promotions. For example, when the weather is dry and hot, hamburger sales tend to increase, therefore hamburger meat will be promoted during this period.

Thirdly, reducing waste is one of the key benefits of implementing **machine learning** into the warehouse management. Picking in-stock items is vital for reducing waste. One way to do this is that the workers will pick the items first including the bin rotation, serial and lot number tracking. After this is done, machine learning adds in the **intelligent planning**. This means it can suggest alternative lot to ship, based on history/need of the product.

Lastly, when it comes to the delivery aspect of the **product machine learning** excels at **visual pattern recognition**, which makes it vital for the task of physical inspection and maintenance. This system is able to identify if a shipping container or product were damaged, time of damage and solutions to repair the damages. This includes visuals, reports and recommendations in real time.

In the Supply Chain, Artificial Intelligence can (and is) wildly used by a lot of giants such as **Amazon** for their warehouse technology. Not only they allow to be faster, but they also make the company **save money on the long-term**.

In a more general way, when it comes to warehousing, AI can be used for:

- Improving inventory accuracy
- Supporting decision-making
- Being a cheaper and quicker workforce

Machine learning can have a huge impact on **data collection** and **decision making**, as a warehouse produces on a daily basis huge amounts of data collected from order numbers, inventory stock levels and shipping data. Machine learning can learn about the data through patterns and algorithms and therefore suggest activities such as the **restock of a product** when that one is almost out of stock.

Speech recognition

This can learn a warehouse employee's voice at specific places where they are in the warehouse and then confirm the accuracy of inventory records.

Robotics

Robots can replace humans for some warehouse tasks, where they exceed them in speed and treated orders per hour. The company Ocado, in one of their old warehouses, is able to process around 3,5 million items or 65,000 orders a week. They do basic tasks such as "lifting", "moving" or "sorting". The bots are geared with claws that they use to grab crates which they pull in their central cavity. Then they move the crate to another location and drop it.

It would be wrong to say that the robots are 'intelligent', or at least to mean it individually. In fact, **their actions are all coordinated by a central computer**. They can however help each other to go pick a quite unusual item that may be some place far, and accomplish in a few minutes a process that can take hours in a more traditional warehouse. Since all the robots are based on the same model, they are all interchangeable. Which means that if one breaks, it can be easily replaced. This results in **economies of scale**, as the mechanical diversity is drastically reduced.

However, **robots cannot completely replace humans** as some things quite easy for us are rather difficult for them to accomplish. For instance, picking a bag of orange seems rather simple, but is nearly impossible

for robots which highly might transform the oranges in orange juice. It is believed that the technology used in the logistics industry will also be used in the coming years by **all the other industries**, as the use of robots is quickly spreading and the technology quickly evolving.

How to use A.I. in Delivery?

Artificial Intelligence in Delivery

In today's world, consumers have high expectations when it comes to real-time delivery of goods and services. Nowadays, companies have a lot more insight on consumer behaviors. With the use of advanced technology, companies can now use machine learning to keep up with traffic, weather, time and consumer desires all at once. This is bridging a gap between traditional delivery immediate delivery.

AI based drones

The company Dorado has begun using Artificial Intelligence to tackle issues in the food industry. They have AI based drones that are aimed at delivering food from any restaurant to any location.

Domino's Robotic Unit

Domino's has created a prototype delivery robot that maintains the appropriate temperature for food and drinks. This robot has the ability to determine the best travel path. This robot has been used in various countries such as, Australia, New Zealand, Belgium, France, Belgium, but it has yet to be introduced on a commercial scale.



Photo credit : Dominos Australia

Optimal Delivery Experience -Budbee

Budbee is an AI delivery system that is rapidly growing in Sweden. It is currently delivering for stores such as H&M, Lindex and Apotea, with plans to expand to other European markets. There is a growing same-day delivery trend, however one of the main issues that consumers face is not knowing exactly what time their packages arrive.

This is how Budbee comes in and solve the problem by giving customers real-time delivery ETAs. Budbee calculates this by calculating the number of stops taken on the route. Therefore, every stop the delivery guy makes the customer is informed by SMS and the time is adjusted.

How to use A.I. in Customer Service?

According to Gartner , research shows that “in a few years from now, 89% of businesses will compete mostly on **customer experience**”. In five years, 85% consumers will have relationships with companies without interacting with human beings. So far 38% of businesses have introduced **Artificial intelligence** to their companies and it is expected to increase to 62% by the end of 2018.

Below are a few examples that show how companies are effectively able to use A.I in Customer Service.

AI Organized Email Inquiries

Reading every email and trying figure out what every customer need can be quite time consuming for a company. AI will eliminate this problem by speeding up the process. This can be done by personalizing

content, which marketers say is 80% more effective. It is also possible to scan and tag emails so that they can be redirected to the right office. This type of technology can reduce the number of customer requests by half.

Important findings for businesses

With AI technology it is now possible to gain insight on your customers. This can be done to predict what your customers may want in the future. Spotify already does this by showcasing their customers' most listened tracks. For example, created customer trends on billboards such as Dear person who played 'Sorry' 42 times on Valentine's Day, what did you do?" and "Dear 3,749 people who streamed 'It's the End of the World as We Know It' the day of the Brexit vote, hang in there."

Sources :

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<https://acquire.io/blog/ai-customer-experience/>

How to incorporate A.I. into products?

In today's world A.I can be incorporated in almost every technology product there is. There is also many software that are being created specifically to make one's life easier by doing most of the thinking and work. Below you will find three different ways A.I is incorporated into products.

1. Virtual Chef

Chef Watson's artificial intelligence is a virtual chef that is by your side every time you cook. This type of Chef is so special because with artificial intelligence, it can help you create a recipe with the ingredients that you already have in your pantry. Alongside creating a recipe, it also provides you with different options and it also gives you instructions on how to prepare the meal.

2. Photographs That Become Purchases

With many online stores on social media these days, sometimes we see something we may like, but we do not know how to find it. Most times we may take a picture or screenshot of it hoping to find it one day, or we have to go on an extensive search to find the product.

Amazon had begun to incorporate a visual search option on its mobile application. This means that you can just take a picture of the product you want, and it will direct you to the product online or something online. With this A.I application is not bridges the gap between seeing a product and buying it without any hassle.

3. News summarization

Brain.SG is a news platform in Singapore that summarizes the news and then places it on their website. This allows for people who do not have the time to read the entire article to just read the highlights of the story. This is a great step in the Artificial intelligence sector. For example, A.I allows for the decrease in redundant information and maximizing the relevancy of the summary. It also focuses on text extraction, language detection and word boundary.

Salesforce has developed an algorithm that uses several machine learning tricks to produce coherent and accurate snippets. So far it is not perfectly researched, it gives a clear picture as to how summarizing text could eventually become automated. Summarizing text will require genuine human intelligence and common sense, which is difficult to implement in a machine.

How to incorporate A.I. into services?

Soon to come.

How to incorporate A.I. into Social Media Marketing?

It is expected that by the end of 2018, 2.5 billion users will have at least one social media channel. Many social media platforms are utilizing AI and marketers should start using this to their advantage. There is no surprise that as technology improves so does the range of tools, especially when it comes to social media. Here are some ways on how Artificial intelligence can be used for social media:

Competitor Analysis

In the areas of strategic planning tracking and analyzing competitors is one of the areas that A.I is used. It has the ability to simultaneously analyze **massive data sets**. This gives marketers the advantage to see how they can integrate the best strategies and techniques.

This can be done with tools that can incorporate **social listening** with software such as Netbase. Or

improve impact performance such as color, visuals, objects and content type. Platforms such as **Crimson Hexagon**, and **Simply Measured** can achieve this.

CONTENT CREATION

Saving time on strategic planning and reporting is key with AI. This allows for marketers to focus more on creating high quality content. When it comes to writing copy, there is certain content that can be completely automated.

Automated Content

Chatbots and virtual assistants are the most common automated content creators. Ecommerce sites use these such as Facebook messaging use this. Some examples are :

Weather bot: Get the weather when you ask

News bot: Find out when interesting things happen

Scheduling bot: Scheduling meetings, reschedule meetings, add participants, whatever you need to keep your calendar up to date.

Cadence

As a Marketer there is always the debate as to how often should one post on social media. Scheduling tools such as Marketo, Marketing.AI, and of course Cortex all have specialized tools automatically generate a posting calendar based on audience and industry data.

Future of Artificial Intelligence

Networking giants such as **Facebook, LinkedIn and Twitter** have begun to use Artificial Intelligence to enhance their deep learning capabilities.

Facebook

Facebook uses artificial intelligence to automatically flag posts that show signs of suicidal thoughts. This allows for them to send this user twice as more suicidal prevention material. This will be also done in different languages.

LinkedIn

LinkedIn uses Machine learning and Artificial Intelligence for most of its products. It can do this by highlighting candidates who are most likely to respond to new opportunities. It has also adapted its job matching algorithms and therefore leads users to 2 million more job applications.

Twitter

Twitter recently added a service using Artificial Intelligence where its users can crop and image and use face detection or create a thumbnail for the entire image. It basically recognizes the important part of the faces and show it in the preview.

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