

ARTIFICIAL INTELLIGENCE (AI) MARKET

GLOBAL FORECAST TO 2020

BY TECHNOLOGY (MACHINE LEARNING, NATURAL LANGUAGE PROCESSING (NLP),
IMAGE PROCESSING, AND SPEECH RECOGNITION), APPLICATION & GEOGRAPHY

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1 EXECUTIVE SUMMARY

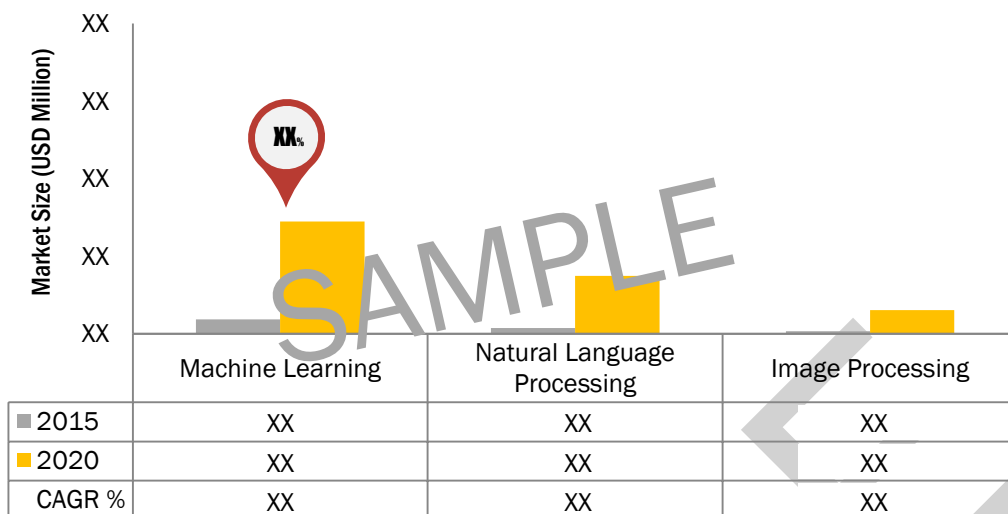
Artificial intelligence refers to the intelligence exhibited by machines or software. It is highly dependent on the software or the algorithms designed to interpret and learn based on past behavior to exhibit intelligence. An algorithm is an intelligent agent that perceives its environment and takes actions that maximize its chances of success. Artificial intelligence depends on a predictable set of outcomes to achieve the anticipated results. Hence, a wide range of algorithms is used to solve a generic problem, or in multiplayer games, or in deterministic and probabilistic planning. The artificial intelligence technology is required to predict future course of actions to improve efficiency, avoid potential diseases, forecast buying behavior of buyers, and determine how changes in the current economic conditions affect the share market. This technology involves a few basic hardware components and relies on the cloud-based services to attain the desired results.

The artificial intelligence market is expected to grow at a CAGR of XX% between 2015 and 2020. The growth of this market is propelled by technologies such as machine learning, natural language processing, and image processing. These technologies are usually used in combination (the combinations vary depending on their applications). This has opened up multiple application areas for artificial intelligence. IBM Corp. (U.S.), Kensho Technologies, Inc. (U.S.), Sentient Technologies (U.S.), Expect Labs, Inc. (U.S.), Narrative Science, Inc. (U.S.), AlphaSense, Inc. (U.S.), Minetta Brook, Inc. (U.S.), and FinGenius Ltd. (U.K.) are some of the prominent companies operating in the natural language processing technology market. Though the growth rate of the market for NLP technology is high, the global artificial intelligence market is still dominated by machine learning technology. This is because machine learning technology forms the base for artificial intelligence and hence, is used across all major application sectors. This trend is expected to remain the same in the coming years. Based on applications, the overall market is currently dominated by the media & advertising sector, with a share of about XX%, followed by the finance, retail, and healthcare sectors. By 2020, the market for artificial intelligence is likely to be dominated by the finance sector and the healthcare sector is expected to witness the highest growth rate.

The report also deals with the factors such as drivers, restraints, and challenges that affect the growth of the artificial intelligence market. One of the major drivers of the market is the diverse application areas of artificial intelligence. The integration of artificial intelligence in a variety of application sectors such as media & advertising, law, agriculture, retail, finance, healthcare, and oil & gas is propelling the growth of this market. Companies such as QlikTech (U.S.) and Expertmaker (Sweden) provide business intelligence solutions to a wide range of customers across multiple application areas. Another driving factor for the market is the capability of artificial intelligence to improve efficiency, along with customer satisfaction. For instance, in the field of finance, machine learning technology allows financial analysts to draw conclusions for stock reactions in co-ordination with market movement. This eradicates the need of scrolling through huge data for the key data points required to arrive at a conclusion. One of the biggest challenges for the market is the creation of models and mechanism of artificial intelligence. To achieve intelligent action, the desired models and mechanisms should be capable of surviving and operating in the physical world and resolving complex scientific problems with a high level of competency.

The report segments the artificial intelligence market on the basis of technology, hardware, service, application, and geography. The market, based on technology, has been segmented into machine learning, natural language processing, image processing, and speech processing. It has been segmented, based on service, into installation, training, and support & maintenance. Based on hardware, the artificial intelligence market has been segmented into computer/GPU chips and cloud. The market, based on application, has been segmented into media & advertising, retail, finance, healthcare, automotive & transportation, law, agriculture, and oil & gas. It has also been segmented on the basis of geography into four major regions—North America, Europe, Asia-Pacific (APAC), and Rest of the World (RoW).

FIGURE 1 MACHINE LEARNING EXPECTED TO DOMINATE THE ARTIFICIAL INTELLIGENCE MARKET DURING THE FORECAST PERIOD



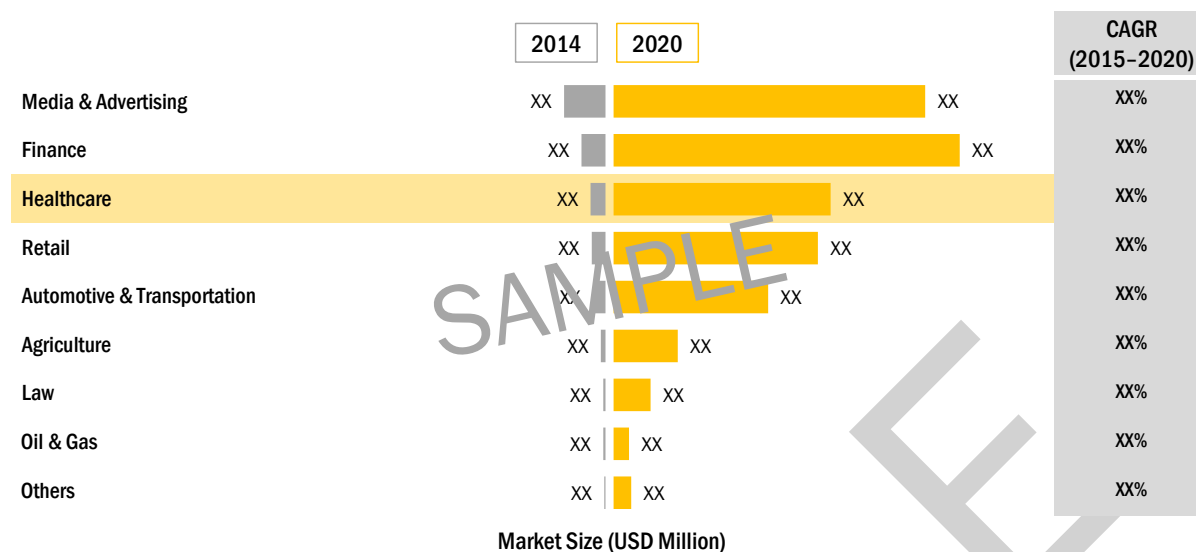
Note: The above diagram depicts only top 3 technologies
 Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

The artificial intelligence market was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. The machine learning technology dominated the artificial intelligence market in 2014, which was valued at USD XX million in the same year and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. This growth can be attributed to the ability of machine learning technology to anticipate the output based on historic trends. This analysis is made based on the amount of data provided as input to the learning algorithm. It helps major sectors such as finance, media & advertising, retail, healthcare, law, automotive & transportation, and oil & gas to leverage on the ability of the machine learning technology to draw valuable insights for improving the efficiency of the work in progress. The major players in the artificial intelligence market include IBM Corp. (U.S.), Google Inc. (U.S.), Microsoft Corp. (U.S.), IPsoft (U.S.), Rocket Fuel, Inc. (U.S.), Mobileye N.V. (Israel), Kensho Technologies, Inc. (U.S.) and Sentient Technologies (U.S.).

On the other hand, natural language processing (NLP) technology is expected to register the highest growth rate of XX% during the forecast period. This is due to the increasing use of NLP technology in the finance, retail, media & advertising, and other sectors. For instance, Minetta Brook, Inc. (U.S.) offers a real-time analytics application for traders and investors that surfaces highly targeted developing news and tweets from across the world before they become headlines. It helps in setting custom alerts that signal fast developing news and tweets around specific market assets. The major players that provide NLP technology across various application areas include IBM Corp. (U.S.), Kensho Technologies, Inc. (U.S.), Sentient Technologies (U.S.), Expect Labs, Inc. (U.S.), Narrative Science, Inc. (U.S.), AlphaSense, Inc. (U.S.), Minetta Brook, Inc. (U.S.), and FinGenius Ltd. (U.K.).

The market for image recognition technology is expected to reach USD XX million by 2020 from USD XX million in 2014. The market share is not substantial due to the limited application areas of image recognition technology, which include agriculture, automotive & transportation, and healthcare sectors. The image processing technology possesses enormous growth opportunities due to high level of activity in driverless cars in the automotive sector.

FIGURE 2 ARTIFICIAL INTELLIGENCE SNAPSHOT (2014–2020): HEALTHCARE SEGMENT EXPECTED TO GROW AT THE HIGHEST CAGR DURING THE FORECAST PERIOD



Source: Secondary Literature, Experts’ Interviews, and MarketsandMarkets Analysis

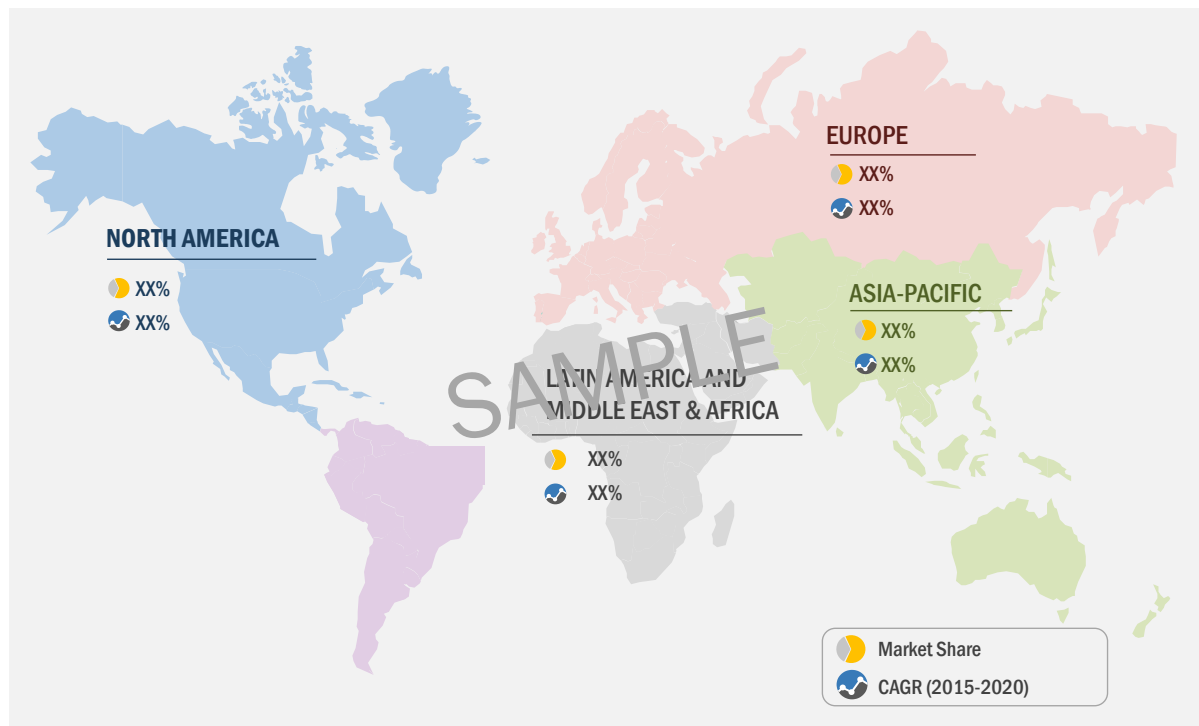
The global artificial intelligence market for application was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. The overall growth in the market is because of the increasing applications of artificial intelligence in the finance, media & advertising, law, agriculture, oil & gas, retail, automotive & transportation, and healthcare sectors. This growth can also be attributed to the ability of the artificial intelligence technology-based systems to provide highly accurate, precised, and reliable data in a considerably short interval of time, thereby helping individuals to make smart decisions with a high level of productivity. The overall market for artificial intelligence is dominated by the advertising & media-based applications, but in the coming years, the market is likely to be dominated by the retail-based applications. The retail-based applications include the use of artificial intelligence for understanding and bending the human buying behavior.

The market for media & advertising applications was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. This growth can be attributed to the increasing use of artificial intelligence in the advertising field allowing customers and businessmen to generate high return on investment (ROI). The extensive use of this technology in drawing real-time advertising decision is complimented by its ability to interpret information quickly and accurately to empower people for making smart decisions for their businesses. The artificial intelligence systems run on an algorithm, which is capable of self-learning and continuously improving their accuracy. The prominent players in the field of media & advertising include Google Inc. (U.S.), Rocket Fuel, Inc. (U.S.), Adbrain Ltd. (U.K.), and Metamarkets (U.S.).

The market for healthcare applications is expected to witness the highest growth rate of XX% from 2015 to 2020. This growth can be attributed to the increasing use of artificial intelligence systems in the field of medicine and life science. Several players in the artificial intelligence market such as IBM Corp. (U.S.), MetaMind, Inc. (U.S.), Zephyr Health (U.S.), and Genescient Corp. (U.S.) offer systems and solutions to the healthcare segment. The major solutions involve addressing of critical business and patient needs by providing epidemiology data, sales data, and profile data for healthcare providers and various other institutions. AI also helps in the field of clinical trials, congress planning, advisory boards, promotional outreach, and untapped sales. The overall market for healthcare applications is expected to reach USD XX million by 2020 from USD XX million in 2014.

On the other hand, the markets for agriculture, law, and oil & gas applications together is expected to grow at a CAGR of about XX% during the forecast period. For instance, the market for law-based applications was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX % during the forecast period.

FIGURE 3 NORTH AMERICA ACCOUNTED FOR THE LARGEST SHARE OF ARTIFICIAL INTELLIGENCE MARKET IN 2015



Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

North America is expected to hold the largest share of the artificial intelligence market by 2020, followed by Europe and APAC. North America accounted for a share of XX% of the artificial intelligence market in 2015, and the market in this region is expected to grow at the CAGR of XX% during the forecast period. Lots of market related activities such as new product developments, start up company formation, mergers & acquisitions are happening in this part of the world. Also the presence of the top AI companies such as like IBM Corp. (U.S.), Microsoft Corp. (U.S.), Google Inc. (U.S.), IPsoft (U.S.), Rocket Fuel, Inc. (U.S.), Kensho Technologies, Inc. (U.S.), and Sentient Technologies (U.S.) will push the North American AI market ahead. Europe accounted for a share of XX% of the artificial intelligence market in 2015. The market in Europe is expected to witness a growth rate of XX% during the forecast period. APAC accounted for a share of XX% of artificial intelligence market in 2015, and the market in APAC is expected to grow at the highest CAGR of XX% during the forecast period. The rapid urbanization and industrialization in the countries such as India and China will increase the demand for AI based solutions and which will push this market ahead.

2 ARTIFICIAL INTELLIGENCE MARKET, BY TECHNOLOGY

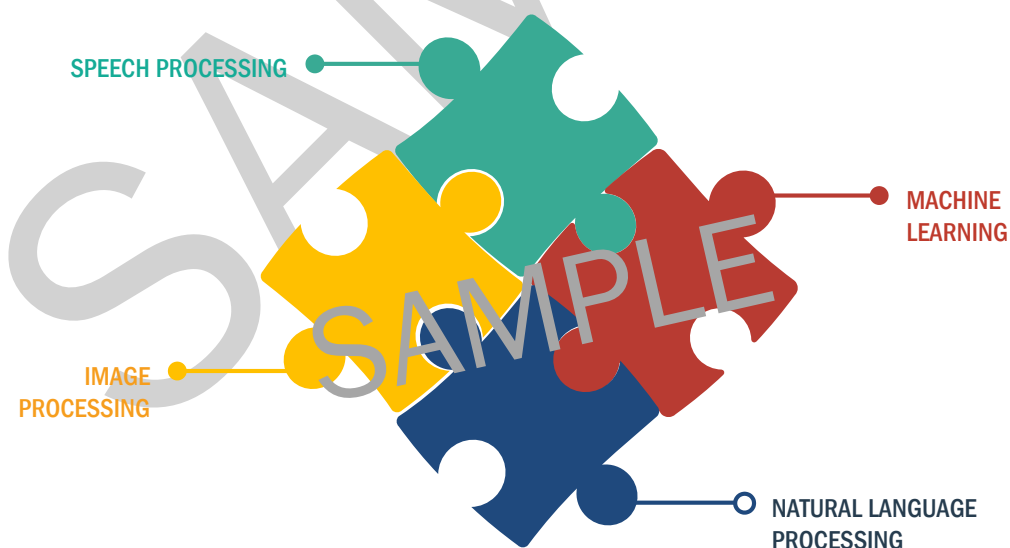
2.1 INTRODUCTION

Artificial intelligence (AI) technology possesses enormous opportunities across multiple application areas. Since AI enables machines to perform activities as that of human beings, it has opened up enormous market opportunities. For instance, several healthcare institutions such as @Point of Care (U.S.), GenieMD Inc (U.S.), and Welltok (U.S.) are shifting toward artificial intelligence for solving critical issues and developing new products. One of the major advancements in the AI technology has taken place in the field of deep learning, which involves using crude-simulated neurons to process data. The development in the AI technology came as a requirement from multiple application areas such as healthcare, advertising & media, retail, automotive & transportation, law, agriculture, oil & gas, and finance.

Companies such as IBM Corp. (U.S.), Microsoft Corp. (U.S.), and Google Inc. (U.S.) are actively involved in the development of the artificial intelligence technology. For instance, Microsoft Corp. (U.S.) has drawn its research into speech recognition and language comprehension. The company used said the AI-based technologies to create its virtual assistant Cortana, which is incorporated in the Windows mobile. In addition, several start-ups have launched products that use machine learning for tasks such as controlling home appliances through voice commands, helping to detect pregnancy, and others. One of the most significant technological advancements in the healthcare sector is Watson, software developed by IBM Corp. (U.S.). It helps doctors use genomic data to choose personalized treatment plans for patients. The need for unnecessary surgery has also reduced after the introduction of a noninvasive test, which is based on AI.

The major technologies of artificial intelligence (AI) include machine learning, natural language processing (NLP), image processing, and speech recognition.

FIGURE 4 ARTIFICIAL INTELLIGENCE MARKET SEGMENTATION



Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

The overall market for artificial intelligence, on the basis of technology, has been segmented into machine learning, natural language processing, image processing, and speech recognition. The technologies for implementing artificial intelligence are used in combinations such as machine learning with natural language processing or image processing.

TABLE 1 ARTIFICIAL INTELLIGENCE MARKET SIZE, BY TECHNOLOGY, 2013–2020 (USD MILLION)

Technology	2013	2014	2015	2016	2018	2020	CAGR (2015–2020)
Machine Learning	XX	XX	XX	XX	XX	XX	XX%
Natural Language Processing	XX	XX	XX	XX	XX	XX	XX%
Image Processing	XX	XX	XX	XX	XX	XX	XX%
Speech Recognition	XX	XX	XX	XX	XX	XX	XX%
Total	XX	XX	XX	XX	XX	XX	XX%

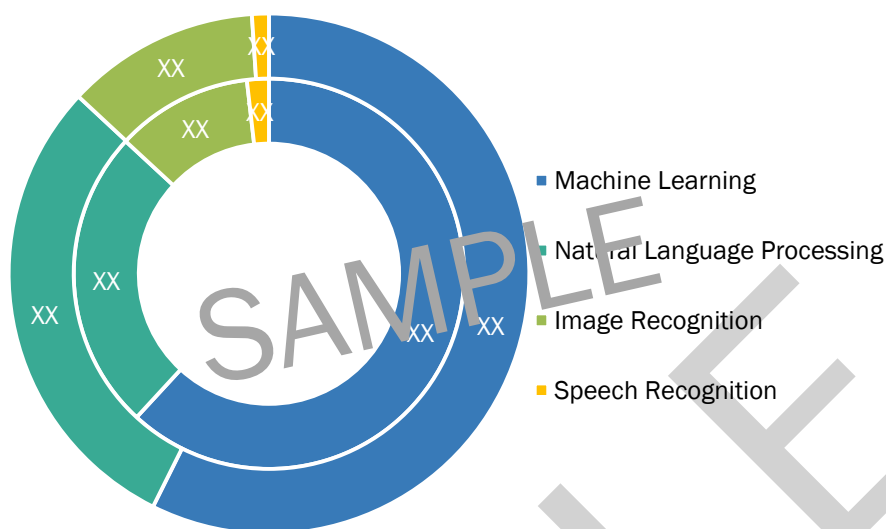
Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

The artificial intelligence market was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. The major players in the artificial intelligence market include IBM Corp. (U.S.), Google Inc. (U.S.), Microsoft Corp. (U.S.), IPsoft (U.S.), Rocket Fuel Inc. (U.S.), Mobileye N.V. (Israel), Kensho Technologies, Inc. (U.S.) and Sentient Technologies (U.S.). Machine learning dominated the market for artificial intelligence in 2014 with a market size of USD XX million, which is expected to reach USD XX million by 2020, at a CAGR of XX%. This growth can be attributed to the increasing use of machine learning in the field of advertising & media, finance, healthcare, law, oil & gas, and automotive & transportation. It is also due to the fact that machine learning is a key element of the AI technology. The market for machine learning technology is expected to continue its dominance during the forecast period.

On the other hand, the market for natural language processing (NLP) technology is expected to register the highest growth rate of XX% during the forecast period. This is due to the growing applications of the NLP technology in the finance, retail, advertising & media, and other sectors. The development of personal assistants such as Siri, Cortana, and Google Now is also propelling the growth of the NLP technology in the overall artificial intelligence market.

The market for image processing also offers promising opportunities in the field of artificial intelligence. It is expected to reach USD XX million by 2020 from USD XX million in 2014, at a CAGR of XX% during the forecast period. The market for image processing technology has considerable growth opportunities as the technology is being increasingly used in the agriculture, healthcare, automotive, and transportation sectors.

FIGURE 5 MACHINE LEARNING TECHNOLOGY HELD THE LARGEST MARKET FOR ARTIFICIAL INTELLIGENCE IN 2015 AND EXPECTED TO CONTINUE ITS DOMINANCE DURING THE FORECAST PERIOD



Note: The circle inside depicts the share for 2015 & the circle outside depicts the share for 2020.

Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

2.2 MACHINE LEARNING

Machine learning is a technology that provides computers with the ability to learn without being explicitly programmed. The technology is focused on the development of computer programs that can update themselves when exposed to new data. The machine learning technology searches through data to look for patterns. It, instead of extracting data for human comprehension, uses the data to improve the understanding of the program. Thus, the technology is capable of making data-driven predictions or decisions rather than just strictly following static program instructions.

In addition, machine learning has strong ties to mathematical optimization and is employed in a range of computing tasks where designing and programming explicit algorithms is infeasible. For instance, machine learning is used in spam filtering, optical character recognition (OCR), search engine, and computer vision applications.

2.2.1 DEEP LEARNING

Deep learning or deep machine learning or deep structured learning is a sub-category of machine learning. It is based on a set of algorithms that strives to model high-level abstractions in data by using multiple processing layers with complex structures. This technique exploits several layers of non-linear information processing for supervised and unsupervised feature extraction and transformation for numerous purposes such as pattern analysis and classification. The levels of abstraction vary from complex to simple concepts. The higher the level of complexity, the more is the requirement for layers in the network. Communication exists between each layer. Once a layer categorizes some kind of information and refines it, it is passed along to the next layer. Hence, the two key aspects of deep learning are models consisting of multiple layers or stages of nonlinear information processing and the methods for supervised or unsupervised learning of feature representation at successively higher, more abstract layers.

The deep learning technique enables a machine to build a hierarchical representation. For instance, the forefront layer might look for simple edges, the next one for collection of the edges forming shapes such as rectangle or circle, and the third might identify body parts such as nose and eyes. After a few considerable layers, which identify the required data, neural network puts these features together resulting in a machine that is capable of recognizing faces.

For training neural networks, graphics processing unit (GPU) plays an important role. The process of training the neural networks, which now takes just days or weeks, could otherwise take months. This is because the GPUs have a massive parallel architecture comprising thousands of small and highly efficient cores designed for handling multiple tasks simultaneously; whereas a typical CPU consists of a few cores that are optimized just for sequential serial processing only.

Machine learning is being adopted by businesses dealing with tremendous amount of data where the time, which once was dedicated for poring over charts and spreadsheets, is now being spent on seeking intelligent ways to automate data analysis. Big players such as Netflix (U.S.) and Amazon.com, Inc. (U.S.) along with Google News have deployed machine learning for analyzing and understanding the users' activities and preferences to recommend movies, articles, and others to sell their products.

The major players in the machine learning technology market include Google Inc. (U.S.), Microsoft Corp. (U.S.), and Kensho Technologies, Inc. (U.S.).

TABLE 2 MACHINE LEARNING TECHNOLOGY MARKET SIZE, BY APPLICATION, 2013–2020 (USD MILLION)

Application	2013	2014	2015	2016	2018	2020	CAGR (2015–2020)
Advertising & Media	XX	XX	XX	XX	XX	XX	XX%
Finance	XX	XX	XX	XX	XX	XX	XX%
Healthcare	XX	XX	XX	XX	XX	XX	XX%
Retail	XX	XX	XX	XX	XX	XX	XX%
Automotive & Transportation	XX	XX	XX	XX	XX	XX	XX%
Agriculture	XX	XX	XX	XX	XX	XX	XX%
Law	XX	XX	XX	XX	XX	XX	XX%
Oil & Gas	XX	XX	XX	XX	XX	XX	XX%
Others	XX	XX	XX	XX	XX	XX	XX%
Total	XX	XX	XX	XX	XX	XX	XX%

Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

Machine learning is a key element of the artificial intelligence technology. It has applications in the healthcare, law, agriculture, automotive & transportation, oil & gas, retail, advertising & media, and finance sectors. The market for machine learning technology was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. The increasing number of application areas for this technology is contributing to the growth of the overall market for machine learning. For instance, in the finance sector, the machine learning technology is used to help financial analysts and brokers to solve complex financial queries by crunching hundreds and thousands of data. Similarly, in the field of advertising & media, the machine learning technology is used to help the marketers to track the buyers' purchase behavior to influence their buying decision.

3 ARTIFICIAL INTELLIGENCE BY HARDWARE & SERVICE

3.1 ARTIFICIAL INTELLIGENCE BY HARDWARE

Artificial intelligence depicts the ability of a computer to perform intelligent operations. These operations are analogous to learning and decision making in the humans. A computer system needs a good hardware to display intelligent capabilities. The hardware devices typically required for artificial intelligence software to run include a CPU, a RAM, a video card, and others. There is a necessity of a few input devices such as monitors and speech recognition units as well. The software integrated in a computer system is responsible for carrying out the complex operations. It synthesizes the data received from the hardware and processes it in the AI system to generate an intelligent response. The software is created using non-procedural languages such as LISP and PROLOG as these languages allow the system to learn and modify the responses according to its environment. The software can be installed in the systems with a fast CPU, high capacity RAM, large storage capacity, a graphic card, and a few specialized input and output devices, depending on the applications. With the increasing technological advancements, large hardware devices are expected to be replaced by smaller, more efficient, and powerful neuromorphic chips-based systems. The neuromorphic chips have the capability to work like human brain as they are based on technologies such as lateral spin valves and memristors (transistors with memory). A few companies also offer artificial intelligence services over the cloud.

3.1.1 COMPUTER / GPU CHIP

Artificial intelligence requires computer-based systems equipped with CPUs, RAMs, memory boards, and other devices to analyze huge data. The modern computers are good for crunching numbers, which are being utilized to make intelligent decisions in the real world. Artificial intelligence helps in the automatic and reliable operation of cars in all conditions. It also allows the smartphones to act as competent conversational assistants. The computer systems are highly efficient, making them an ideal choice for the artificial intelligence software to be integrated with. But they are power-consuming and sometimes huge in size. For instance, Google Inc. (U.S.) has designed software that has the capability to reliably recognize cats and human faces in video clips. To achieve the desired output, the requirement was of about 16,000 powerful processors. However, the advancements in the neuroscience chip technology will reduce the gap between artificial and natural computation. These advanced neuromorphic chips can be integrated with CPUs to enhance their capability of pattern recognition, along with data mining, to yield answers to complex questions in the field of finance, legal, advertising, and others. The neuromorphic chips, with time, can be integrated with the conventional systems; but they will not be able to perform complex operations as these chips are yet to be commercialized. These chips, once released, can be integrated with the smartphones, replacing the traditional GPUs, to enable pattern and signal recognition and carry out other instructions.

3.1.2 CLOUD

Cloud-based artificial intelligence (AI) is gaining traction across a wide range of application areas. This is because of its ability to rapidly design and deliver the make-to-order artificial intelligence systems. AI can be easily integrated in the existing web applications and servers, thereby eradicating the need of runtime and server codes, which are used in computers and server-based on-site AI systems. These AI systems can be effortlessly integrated through single AJAX JavaScript calls. For instance, TinMan Systems (U.S.) provides cloud-based AI systems that are easy to integrate and are deprived of runtime and coding. It also provides systems incorporated with AI technologies such as natural language processing, search, geo-location, personal, and IP identification service integration. Alibaba Group (China) focuses on launching an artificial intelligence service that combines the algorithms used by Alibaba with machine and deep learning techniques and presents them in a simple drag-and-drop interface. This uses Aliyun's Open Data Processing Service (ODPS) platform, which is capable of processing 100 petabytes of data in six hours. In

addition, Amazon.com, Inc. (U.S.) has introduced an artificial intelligence service that allows individuals add predictive and analytical capabilities to their applications. It is a fully managed machine learning service for developers with negligible or no experience. The data submitted to the AI service remains private and the system is intended to get smarter with time as the customer deploys more data in it.

3.1.3 OTHERS

The others segment includes storage device, network product, and neuromorphic chip for artificial intelligence by hardware.

3.2 ARTIFICIAL INTELLIGENCE BY SERVICE

Artificial intelligence is a complex method as it requires implementation of sophisticated algorithms for a varied range of applications in the healthcare, finance, legal, manufacturing, medical, oil & gas, entertainment, retail, automotive, and other sectors. Hence, for artificial intelligence, there is a need of software installation; training programs; and support & maintenance services to achieve the desired result. Most of the companies that manufacture and develop artificial intelligence systems and software require both online and offline support, depending on the applications. The companies operating in the artificial intelligence services market include IBM Corp. (U.S.), QlikTech International AB (U.S.), and Expertmaker (U.S.). These companies offer assistance for installation, training, and support, along with online assistance and post-maintenance of software, to the organizations seeking assistance for the same to provide the desired services for their customers.

FIGURE 6 ARTIFICIAL INTELLIGENCE MARKET SEGMENTATION, BY SERVICE



Note: Others include customization and application integration.

Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

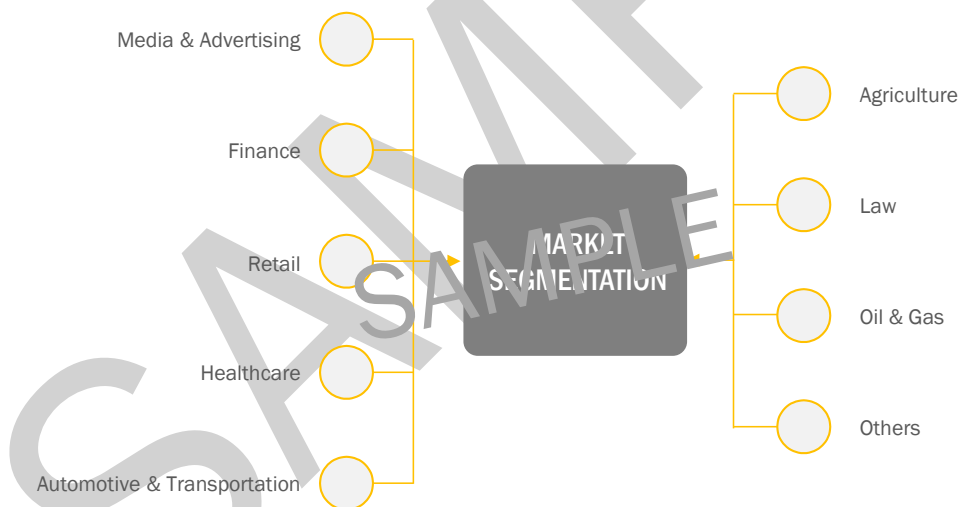
The overall artificial intelligence market has been segmented into three broad categories based on service: installation, training, support & maintenance, and others.

4 ARTIFICIAL INTELLIGENCE MARKET, BY APPLICATION

4.1 INTRODUCTION

Artificial Intelligence (AI) is a technology that has the capability of imitating human-like intelligence. With time, AI has expanded its reach across multiple application areas. The major application areas of AI include advertising & media, retail, healthcare, finance, automotive & transportation, agriculture, law, and oil & gas. For instance, in the field of healthcare, companies such as IBM Corp. (U.S.) are focusing on helping the medical specialists to address critical patient needs and provide remedial measures. In the finance sector, AI is used to assist the financial analysts to analyze huge data to interpret valuable information that helps in the decision making process. Artificial intelligence (AI) is used by the companies such as Kensho Technologies, Inc. (U.S.), AlphaSense, Inc. (U.S.), and Minetta Brook Inc. (U.S.) to help the financial analysts to simplify their jobs by removing the need to search for information from the big data piles to pick valuable information regarding stocks and other financial elements. Similarly, in the retail sector, artificial intelligence helps various organizations worldwide to understand the consumer behavior through continuous monitoring. It allows the ecommerce retailers and store owners to track the consumers' behavior to influence their purchase decisions, thereby enhancing their revenue. The typical companies in the retail sector include Amazon.com, Inc. (U.S.), Bay Sensors (U.S.), Narrative Science Inc. (U.S.), and Prism Skylabs (U.S.). Technologies such as machine learning, natural language processing, image processing, and speech recognition are working in tandem to leverage the power of artificial intelligence.

FIGURE 7 ARTIFICIAL INTELLIGENCE MARKET: SEGMENTATION

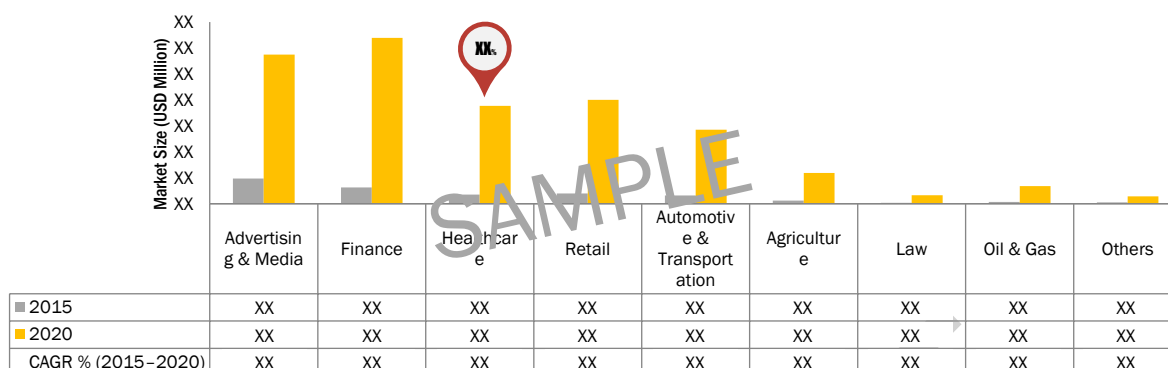


Others include education and philanthropy sectors.

Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

The artificial intelligent market, based on application, has been broadly classified into media & advertising, finance, retail, healthcare, automotive & transportation, agriculture, law, oil & gas, and others.

FIGURE 8 THE AI MARKET FOR THE HEALTHCARE SECTOR EXPECTED TO WITNESS THE HIGHEST GROWTH RATE DURING THE FORECAST PERIOD



Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

TABLE 3 ARTIFICIAL INTELLIGENCE MARKET SIZE, BY APPLICATION, 2013-2020 (USD MILLION)

Application	2013	2014	2015	2016	2018	2020	CAGR (2015-2020)
Advertising & Media	XX	XX	XX	XX	XX	XX	XX%
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Healthcare	XX	XX	XX	XX	XX	XX	XX%
Retail	XX	XX	XX	XX	XX	XX	XX%
Automotive & Transportation	XX	XX	XX	XX	XX	XX	XX%
Agriculture	XX	XX	XX	XX	XX	XX	XX%
Law	XX	XX	XX	XX	XX	XX	XX%
Oil & Gas	XX	XX	XX	XX	XX	XX	XX%
Others	XX	XX	XX	XX	XX	XX	XX%
Total	XX	XX	XX	XX	XX	XX	XX%

Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

The global artificial intelligence market, segmented on the basis of application, was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. This growth in the market can be attributed to the increasing applications of artificial intelligence in the media & advertising, finance, agriculture, legal, manufacturing, oil & gas, retail, automotive & transportation, and healthcare sectors as the AI-based systems provide highly accurate, precise, and reliable data in a considerably short interval of time, thereby helping individuals make smart decisions with a high level of productivity. The overall market for the artificial intelligence is dominated by the market for the advertising & media sector. However, the artificial intelligence market is likely to be led by the AI market for the retail sector in the coming years.

The AI market for the advertising & media sector was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. The growth can be attributed to the increasing use of artificial intelligence in the field of advertising, thereby allowing customers and business owners to generate high return on investment (ROI). The extensive use of this technology in drawing real-time advertising decision is complimented by its ability to interpret information quickly and

accurately to empower people for making smart decisions for their businesses. The artificial intelligence systems run on an algorithm, which is capable of self-learning and continuously improving the accuracy of the systems.

The AI market for the healthcare sector is expected to witness the highest growth rate of XX% during the forecast period. This growth can be attributed to the increasing use of artificial intelligence systems in the field of medicine and life sciences. Several key players, operating in the artificial intelligence market, such as IBM Corp. (U.S.), MetaMind, Inc. (U.S.), Zephyr Health (U.S.), and Genescient Corp. (U.S.) offer AI-based systems and solutions to the healthcare sector. The major solutions include addressing of critical businesses and patient needs by providing epidemiology data, sales data, and profile data for the healthcare providers and various other institutions. AI also helps in clinical trials, congress planning, advisory boards, promotional outreach, and untapped sales opportunities. The overall AI market for the healthcare sector is expected to reach USD XX million by 2020 from USD XX million in 2014.

On the other hand, the AI market for the agriculture, law, and oil & gas, sectors holds several growth opportunities as it is expected to grow at a growth rate of about XX% during the forecast period. The AI market for the law sector was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period.

4.1.1 MEDIA & ADVERTISING

Artificial intelligence has gained high importance in the field of marketing, mainly for media and advertising purposes. In the field of media and advertising, AI helps to identify relevance – whether it refers to personalizing online content and other recommendations, or more effectively targeting advertising. The media & advertising sector contributes majorly to the artificial intelligence market.

AI helps marketers in the field of media & advertising to visualize programmatic trends and opportunities as they happen and focus on building profound client relationships. For instance, Rocket Fuel Inc. (U.S.) provides a marketing platform, which offer integration of both data management platform (DMP) and demand-side platform (DSP) to provide a robust marketing solution.

TABLE 4 ARTIFICIAL INTELLIGENCE MARKET FOR MEDIA & ADVERTISING, BY TECHNOLOGY, 2013-2020 (USD MILLION)

Technology	2013	2014	2015	2016	2018	2020	CAGR (2015-2020)
Machine Learning	XX	XX	XX	XX	XX	XX	XX%
Natural Language Processing	XX	XX	XX	XX	XX	XX	XX%
Image Processing	XX	XX	XX	XX	XX	XX	XX%
Speech Recognition	XX	XX	XX	XX	XX	XX	XX%
Total	XX	XX	XX	XX	XX	XX	XX%

Source: Secondary Literature, Experts' Interviews and MarketsandMarkets Analysis

The overall AI market for the media & advertising sector is expected to grow at a CAGR of XX% during the forecast period to reach USD XX million by 2020 from USD XX million in 2014. The growth can be attributed to the increasing applications of artificial intelligence in the media & advertising sector. The advertising applications require reliable insights at an exceptional accuracy to bank on for making smart decisions to increase the customer base by offering valuable and critical information. This helps to target customers at the probable time of purchase to offer an individual with a detailed product information, thereby influencing the buyer's purchase decision.

The media & advertising sector utilizes numerous technologies based on artificial intelligence such as machine learning, natural language processing, image processing, and speech recognition. The market for the machine learning technology was valued at USD XX million in 2014. It led the overall AI market in 2014 and is expected to continue its dominance during the forecast period. The market is expected to reach USD XX million, growing at a CAGR of XX% between 2015 and 2020. Machine learning helps advertisers to visualize the needs of the market in real-time and convert opportunities to build profound client relationships. The highest growth rate of XX% is expected to be exhibited by the natural language processing technology market during the forecast period for the field of media & advertising sector. This growth can be attributed to the increasing use of artificial intelligence by the organizations, such as Google Inc. (U.S.), Rocket Fuel In. (U.S.), Adbrain Ltd. (U.K.), and Metamarkets (U.S.), operating in the advertising sector.

TABLE 5 ARTIFICIAL INTELLIGENCE MARKET FOR MEDIA & ADVERTISING , BY GEOGRAPHY, 2013–2020 (USD MILLION)

Region	2013	2014	2015	2016	2018	2020	CAGR (2015–2020)
North America	XX	XX	XX	XX	XX	XX	XX%
Europe	XX	XX	XX	XX	XX	XX	XX%
APAC	XX	XX	XX	XX	XX	XX	XX%
RoW	XX	XX	XX	XX	XX	XX	XX%
Total	XX	XX	XX	XX	XX	XX	XX%

Source: Secondary Literature, Experts' Interviews and MarketsandMarkets Analysis

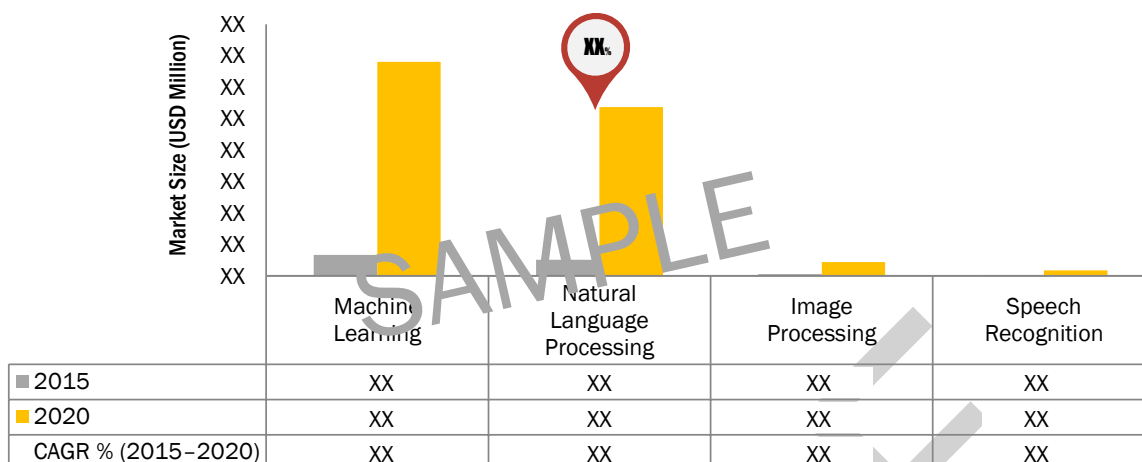
The media & advertising sector has been gaining traction due to the increasing penetration of artificial intelligence in this sector. The AI market for the media & advertising sector in North America held the largest market size, USD XX million, in 2014. It is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. This media & advertising has been encountering considerable advancements due to the increasing use of AI for performance improvement of the marketing campaigns through better decision making and a highly accurate campaign measurement. Companies such as Google Inc. (U.S.), Rocket Fuel In. (U.S.), Metamarkets (U.S.), and Prismatic (U.S.) are the major players in North America operating in the field of media & advertising. However, the highest growth rate of XX% is expected to be shown by the AI market for the media & advertising sector in APAC.

4.1.2 FINANCE

Finance is an integral part of the day-to-day business and is one of the driving factors of the world's economy. The rising trend in entrepreneurship and the growing companies globally is increasing the amount of financial data on a global scale. With such huge volume of data, the analysts would typically need to spend a considerable amount of time analyzing the data to provide assistance to the customers. Several companies, such as Kensho Technologies, Inc. (U.S.), provide real-time statistical computing platform with natural language capabilities, big data and machine learning, and scalable analytics architectures. The knowledge platform is designed specifically for investment professionals to address the highly significant and complex queries that lie within the financial market today.

The prominent players in the finance sector harnessing the power of artificial intelligence include Kensho Technologies, Inc. (U.S.), Narrative Science Inc. (U.S.), AlphaSense, Inc. (U.S.), and Minetta Brook Inc. (U.S.).

FIGURE 9 NATURAL LANGUAGE PROCESSING LIKELY TO EXHIBIT HIGHEST GROWTH RATE IN THE ARTIFICIAL INTELLIGENCE MARKET FOR THE FINANCE SECTOR



Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

TABLE 6 ARTIFICIAL INTELLIGENCE MARKET SIZE FOR FINANCE, BY TECHNOLOGY, 2013–2020 (USD MILLION)

Technology	2013	2014	2015	2016	2018	2020	CAGR (2015–2020)
Machine Learning	XX	XX	XX	XX	XX	XX	XX%
Natural Language Processing	XX	XX	XX	XX	XX	XX	XX%
Image Processing	XX	XX	XX	XX	XX	XX	XX%
Speech Recognition	XX	XX	XX	XX	XX	XX	XX%
Total	XX	XX	XX	XX	XX	XX	XX%

Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

The artificial intelligence market for the finance sector is expected to grow at a CAGR of XX% during the forecast period. It was valued at USD XX million in 2014 and is expected to reach USD XX million in 2020. The growth can be attributed to the applicability of artificial intelligence in deriving solutions for the complex financial queries influencing the market movement to arrive at a well-informed decision. For instance, the AI-based systems from companies such as Dataminr (U.S.) transform the public datasets and twitter stream into actionable signals. This helps to retrieve information in real-time in the field of finance, news, security, and crisis management.

Several players in the financial sector such as Kensho Technologies, Inc. (U.S.), Dataminr (U.S.), Minetta Brook Inc. (U.S.), and FinGenius Corp. (U.K.) offer systems that are capable of learning patterns in the numerous financial inputs to predict performance of stock prices in a month to year term range. Also, with the integration of natural language processing with machine learning, the AI-based software is now able to exploit the narrative and textural components providing additional insights of the senior management to help predict the market more precisely. The market for machine learning was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% during the forecast period. Natural language processing (NLP), despite having a lower market share than machine learning, shows positive signs of growth since the demand for NLP have increased. The overall NLP market is expected to grow at the highest CAGR of XX% during the forecast period.

TABLE 7 ARTIFICIAL INTELLIGENCE MARKET FOR FINANCE, BY GEOGRAPHY, 2013–2020 (USD MILLION)

Region	2013	2014	2015	2016	2018	2020	CAGR (2015–2020)
North America	XX	XX	XX	XX	XX	XX	XX%
Europe	XX	XX	XX	XX	XX	XX	XX%
APAC	XX	XX	XX	XX	XX	XX	XX%
RoW	XX	XX	XX	XX	XX	XX	XX%
Total	XX	XX	XX	XX	XX	XX	XX%

Source: Secondary Literature, Experts' Interviews, and MarketsandMarkets Analysis

The artificial intelligence market for the finance sector in North America was valued at USD XX million in 2014 and is expected to reach USD XX million by 2020, at a CAGR of XX% between 2015 and 2020. The major players operating in the finance sector in North America include Dataminr (U.S.), Minetta Brook Inc. (U.S.), and Kensho Technologies, Inc. (U.S.). However, the highest growth rate of XX% is expected to be exhibited by the AI market for the finance sector in APAC during the forecast period. It is expected to reach USD XX million by 2020 from USD XX million in 2014; and it is likely to surpass the European AI market for the finance sector by 2020.

4.1.3 RETAIL

Retail involves selling of consumer goods or services to customers using various channels of distribution such as grocery stores, ecommerce, online portals, and others. Artificial intelligence (AI) is used extensively in the retail sector to make shopping experience similar to what the customers are accustomed to. AI plays a vital role in determining the shopping trend by helping the retailers to understand the consumers' behavior, thereby influencing their buying decision. AI plays a major role in the retail stores, as with the help of proximity triggers installed within the store premises, the retailer can determine the shopper's location in real-time, such as the amount of time spent in a particular section of the store, and send offer texts to influence the shopper's purchase decision. Companies such as Prism Skylabs (U.S.) offer BI tool via cloud-based services to remotely audit, manage, and optimize businesses.

AI drastically reduces the time and energy spent by people for analyzing, interpreting, and explaining data to identify the metrics and meet the purpose of analysis. The prominent players in the artificial intelligence market offering tools or platforms in the retail sector include Amazon.com, Inc. (U.S.), Celect, Inc. (U.S.), Bay Sensors (U.S.), Narrative Science Inc. (U.S.), and Prism Skylabs (U.S.).

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