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## 2. Artificial Intelligence (AI) is transforming the world

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The world is changing rapidly as a result of artificial intelligence (AI). Some of the world's most intractable issues are being addressed by AI applications ranging from autonomous vehicles to individualised healthcare. New medications and therapies, early disease diagnosis, and individualised care are all possible thanks to AI's application in the healthcare sector. For instance, AI-driven systems can do medical picture analysis at a rate and precision that exceeds that of human specialists. Artificial intelligence is being used to create vehicles that can operate without a human driver. The advent of autonomous vehicles might completely alter the transportation landscape by making it more convenient, cost-effective, and secure for everyone. AI is being utilised in manufacturing to automate processes, boost quality, and cut costs. Robots driven by artificial intelligence, for instance, can do assembly tasks more efficiently and accurately than humans can.

These are just a few of the ways in which AI is changing society. In the years to come, we may anticipate even more creative and consequential uses of AI technology.

### **Here are some of the ways in which AI is already transforming the world:**

**Healthcare:** AI is being used to develop new drugs and treatments, diagnose diseases earlier, and provide personalized care. For example, AI-powered systems can now analyze medical images faster and more accurately than human doctors.

**Transportation:** AI is being used to develop self-driving cars and trucks. Self-driving vehicles have the potential to revolutionize transportation, making it safer, more efficient, and more accessible.

**Manufacturing:** AI is being used to automate tasks, improve quality, and reduce costs. For example, AI-powered robots can now assemble products with greater precision and speed than human workers.



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**Customer service:** AI is being used to provide 24/7 customer support, answer questions, and resolve issues. For example, AI-powered chatbots can now handle a wide range of customer inquiries, freeing up human agents to focus on more complex tasks.

**Education:** AI is being used to personalize learning, provide feedback, and grade assignments. For example, AI-powered systems can now identify each student's learning style and provide tailored instruction.

**Finance:** AI is being used to detect fraud, manage risk, and make investment decisions. For example, AI-powered systems can now analyze large amounts of data to identify potential fraudulent transactions.

**Environment protection and sustainability:** AI is being used to monitor and protect the environment. For example, AI-powered systems can now track deforestation, monitor pollution levels, and predict natural disasters.

These are just a few examples of how AI is already transforming the world. As AI technology continues to develop, we can expect to see even more innovative and impactful applications in the years to come.

Tohugh, in the medical field, AI is being put to use in the creation of new pharmaceuticals and therapies, the advancement of illness diagnosis, and the delivery of patient-specific care. For instance, AI-driven systems can do medical picture analysis at a rate and precision that exceeds that of human specialists.

There are many ways in which artificial intelligence (AI) is changing the healthcare sector:

AI-driven diagnostics tools are currently being utilised to examine medical images for signs of disease. Mammograms for breast cancer detection and magnetic resonance imaging (MRI) scans for brain tumour detection are only two examples of the types of imaging data being analysed by AI-driven systems.

AI is being used to create cutting-edge medicines and therapies. Artificial intelligence is being utilised, for instance, to create compounds with the potential to treat cancer. AI is being utilised to

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generate individualised treatment plans for patients. Patients are receiving treatment recommendations tailored to their unique medical history and risk factors thanks to AI-driven solutions.

New methods for disease prevention are being developed with the help of AI. Artificial intelligence (AI) is being utilised, for instance, to create patient-specific risk assessments that can aid in the early detection and prevention of disease.

Appointment scheduling, patient record keeping, and insurance claim filing are just a few examples of the administrative duties that can be automated with the help of artificial intelligence in the healthcare industry. This can allow medical staff to devote more time to treating patients.

Artificial intelligence has the potential to greatly advance medical practice and the quality of life for patients everywhere. While AI has great potential in the healthcare industry, it is vital to remember that the technology is still in its infancy and faces a number of obstacles that must be overcome. Among these difficulties are:

To train and function, AI systems need access to massive amounts of data. This information could be utilised to observe and anticipate the behaviour of individuals. The implications for data privacy and security are worrying.

Artificial intelligence (AI) systems can be biased if they are taught with biased data. This has the potential to result in unjust discrimination against certain populations.

The inability to interpret the reasoning behind AI system decisions is known as "interpretability." This makes it more challenging to put faith in AI systems and to employ them in ethical ways.

Despite these limitations, AI shows promise in the healthcare sector. To guarantee that AI is used for good and not evil as it advances, it will be crucial to work to address these concerns.

AI is being used to create vehicles capable of driving itself. The advent of autonomous vehicles might completely alter the transportation landscape by making it more convenient, cost-effective, and secure for everyone.



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There are many ways in which artificial intelligence (AI) is changing the transportation sector:

AI is being utilized to create self-driving automobiles, which have the potential to significantly improve the safety, efficiency, and accessibility of transportation.

Route optimization, maintenance scheduling, and vehicle performance monitoring are just some of the ways that AI is being utilized to enhance fleet management.

Optimization of traffic lights, traffic congestion forecasting, and incident management are all areas where AI is being utilized to better manage traffic.

Robots and other intelligent systems are being utilized to automate tasks in warehouses that need AI, such as picking and packaging orders.

Flight scheduling, crew resource management, and delay prediction are just a few areas where airlines are putting AI to good use.

In the transportation sector, AI could lead to significant improvements in safety, efficiency, and accessibility. Though AI is promising, it is still in its infancy, and there are still obstacles to overcome before it can be widely deployed in the transportation sector. Examples of such difficulties are:

For AI systems to be used in the real world, researchers and developers must take precautions to assure their security. Governments should develop rules for the creation and use of AI in vehicular settings. Before artificial intelligence in transportation to be extensively utilized, the public must be made aware of its potential benefits and dangers.

While these obstacles must be overcome, AI's promise to revolutionize the transportation sector remains undented. To guarantee that AI is used for good and not evil as it advances, it will be crucial to work to address these concerns.

**Some current applications of artificial intelligence in the transportation sector are as follows:**

Waymo is a business working on autonomous vehicle technology. Waymo has driven its autonomous vehicles more than 10 million miles on public roads.

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To better manage its fleet, Uber is implementing AI. When it comes to route optimization, maintenance planning, and vehicle performance monitoring, Uber turns to AI.

Waze is a navigation and traffic information service provider. Waze employs AI to foresee gridlock and proposes detours.

Amazon: Artificial intelligence is being used to automate Amazon warehouses. Amazon's fulfillment centers are staffed by robots and other AI-powered devices.

Delta Airlines: Delta is enhancing its airline operations with the use of artificial intelligence. Flight times are optimized, crew resources are managed, and delays are forecasted with the help of AI at Delta.

These are only a few of the many current applications of AI in the transportation sector. More and more creative uses of AI are likely to appear in the transportation sector as the field of AI progresses.

AI is also being implemented in the manufacturing sectors to automate processes, boost productivity, and save overhead. Assembling things, for instance, is now a task that can be completed by AI-enabled robots more quickly and accurately than by humans.

**Some of the ways in which AI is changing manufacturing are as follows:**

Artificial intelligence (AI) may evaluate data from sensors and other sources to foresee when machinery will break down, allowing for preventative maintenance to be performed. Maintenance can be planned in advance of a breakdown, saving manufacturers money and time.

AI is being employed in the robotics industry to create machines that can carry out activities that people find risky or difficult. This has the potential to enhance factory security and productivity.

AI can be used for quality control by checking items for flaws. This has the potential to enhance quality and lessen the frequency of product recalls.

New product designs can be created with the help of AI in the design phase. Manufacturers can use this information to develop cutting-edge goods that accurately address consumer wants and needs.

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AI can be applied in supply chain management to make the system more efficient. This has the potential to enhance productivity while decreasing expenses.

Artificial intelligence (AI) can be utilized to help customers. Manufacturers can benefit from this because it increases customer happiness and brand loyalty.

Although AI is still in its infancy, it has the potential to dramatically alter the manufacturing sector. Artificial intelligence (AI) can help industries compete in a worldwide economy by automating activities, increasing efficiency, and decreasing costs.

**Currently, AI is being applied in the following ways in the manufacturing industry:**

To anticipate when its aircraft engines will fail, General Electric is turning to artificial intelligence. To avoid downtime and expensive repairs, the organization can schedule maintenance in advance.

Using artificial intelligence, Siemens is creating robots that can weld and paint, two tasks that are either dangerous or too complicated for people. This has the potential to enhance factory security and productivity.

Bosch uses AI to check for flaws in their goods. This has the potential to enhance quality and lessen the frequency of product recalls.

New product designs at Toyota are being created with the help of AI. This has the potential to aid the business in developing cutting-edge items tailored to the needs of its clientele.

AI is being used to improve Amazon's supply chain efficiency. As a result, the business has been able to cut costs and increase productivity.

Tesla's AI-powered customer service is second to none. The result has been increased client happiness and loyalty to the brand.

These are only some of the many applications of AI in the manufacturing sector. We may anticipate even more cutting-edge uses of AI in manufacturing as the technology advances.



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AI is being utilized in customer care to give around-the-clock assistance, answer inquiries, and fix problems. Chatbots enabled by artificial intelligence, for instance, can now field a wide variety of client enquiries, allowing human representatives to focus on higher-level duties.

There are many ways in which the field of customer service is being revolutionized by artificial intelligence (AI).

**Some of the more noticeable ways that AI is influencing customer service are as follows:**

Chatbots are software applications that can mimic human speech. Businesses are increasingly turning to chatbots to handle client inquiries. All day, every day, chatbots may help clients with their inquiries and problems.

Appointment scheduling, restaurant bookings, and package monitoring are just some of the ways in which virtual assistants can serve clients. You can talk to a virtual assistant or use text and chat to communicate with one.

Sentiment analysis is a method for analyzing consumer feedback and spotting patterns. Customer contentment, areas of customer service that can be enhanced, and the creation of new products and services can all benefit from sentiment research.

Using a method called predictive analytics, businesses may foresee how their clients would act. Customers at risk of leaving can be tracked, targeted with marketing efforts, and service quality enhanced with the use of predictive analytics.

A.I. has the potential to improve customer service in several ways, including productivity, effectiveness, and personalization. However, it's crucial to remember that AI is still in its infancy, and that there are still some obstacles to overcome before AI can be fully incorporated into the customer support system. Examples of such difficulties are:

Tools driven by AI must be accurate and trustworthy.



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Artificial intelligence (AI) powered tools must lack bias.

Customers must be open to accepting customer service technologies powered by artificial intelligence. AI still has a shot at changing the way consumers and businesses interact, despite these obstacles. To guarantee that AI is used for good and not evil as it advances, it will be crucial to work to address these concerns.

**Some current applications of AI in customer service are as follows:**

Alexa, Amazon's chatbot for customer care, is powered by artificial intelligence. Alexa is available around the clock to assist consumers with inquiries, problems, and inquiries.

Walmart's virtual assistant, Walmart Genie, is powered by artificial intelligence. Customers can use Walmart Genie to do things like schedule appointments, make bookings, and monitor the status of their orders.

Netflix makes recommendations for movies and TV shows using artificial intelligence. Netflix's recommendation system, which is powered by artificial intelligence, is among the most advanced of its kind.

To evaluate consumer comments and spot emerging patterns, Starbucks employs artificial intelligence. The sentiment analysis system driven by AI at Starbucks has helped the company increase customer happiness and pinpoint service gaps.

Delta Air Lines using artificial intelligence to foresee our customers' actions. Customers at risk of leaving Delta can be pinpointed for marketing campaigns and service enhancements with the help of Delta's AI-powered predictive analytics system.

These are but a few current applications of AI in the field of customer service. More and more creative uses of AI in customer service are on the horizon as AI continues to advance.

In the classroom, AI is utilized for individualized instruction, assessment, and evaluation. With the help of AI, for instance, it is now possible to deliver individualized lessons to each student based on their unique learning preferences.





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The field of education is undergoing several changes as a result of the rise of artificial intelligence (AI). Some of the more noticeable ways that AI is influencing classrooms are as follows:

AI can be used to tailor a student's education to their own needs. This allows them to work at their own pace and concentrate on the areas in which they feel they need the most improvement.

Artificial intelligence (AI) can be utilized to design flexible educational programs. This means that the course can be personalized in terms of both its content and its level of difficulty.

Artificial intelligence (AI) can be used to construct virtual tutors to help teach and counsel students. Those who are struggling academically or are learning from afar may benefit greatly from this.

Data about student learning can be gathered and analyzed with the use of AI, a field known as "learning analytics." This information can help teachers zero in on pupils' weak spots, monitor their development, and enhance their education.

Education could be greatly improved by the application of AI, which has the potential to make it more individualized, flexible, and efficient. However, it is crucial to remember that AI is still in its formative stages, and that several obstacles must be overcome before AI can be fully integrated into the educational system. Examples of such difficulties are:

Educative technologies powered by artificial intelligence can be quite pricey.

Accuracy: It is essential that AI-based learning systems provide accurate and trustworthy results.

Bias: AI-powered learning platforms must be objective.

Teachers and students must be open to using instructional technologies powered by artificial intelligence.

AI still has a shot at revolutionizing education, despite these obstacles. To guarantee that AI is used for good and not evil as it advances, it will be crucial to work to address these concerns.

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**Some current applications of AI in teaching include the following:**

Knewton is an artificial intelligence (AI)-based learning platform. The Knewton system collects and analyzes student performance data to tailor instruction to each individual learner.

Catalyst is an organization that employs AI to design flexible educational opportunities. In order to personalize the learning experience for each student, the Catalyst platform analyzes their individual performance data.

Socratic is an artificial intelligence (AI) firm that develops online teaching assistants. Answers, explanations, and practice problems on the Socratic platform are tailored to each individual student based on their performance statistics.

Analytics for Blackboard's Learning Management System Learn analytics is an AI-powered system for gathering and analyzing information on educational outcomes. Blackboard Learn analytics can be used to pinpoint trouble spots, monitor development, and enhance the educational process for all users. Some current applications of AI in classrooms include the ones listed above. It's only natural that as AI advances, creative new uses of it in the classroom would emerge.

In the financial sector, AI is being used to combat fraud, control risks, and guide investment choices. To spot potential fraudulent transactions, for instance, AI-powered systems can now examine massive data sets.

There are many ways in which artificial intelligence (AI) is changing the financial services industry.

Credit card fraud, money laundering, and other forms of financial crime can now be uncovered with the help of artificial intelligence. For instance, artificial intelligence (AI)-driven systems are being used to sift through mountains of data in search of telltale signs of fraud.

AI is being used to evaluate many types of risk, such as the probability of a loan default or a stock market catastrophe. For instance, artificial intelligence (AI)-driven systems are analyzing past data and current market situations to spot dangers.

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Stock and bond picking are only two examples of how AI is being put to work in the investment management industry. For finding cheap stocks and bonds, for instance, AI-driven algorithms are analyzing massive amounts of data.

Answering questions and addressing complaints are just two examples of how artificial intelligence (AI) is being put to work in customer service. For instance, chatbots powered by AI are being deployed to respond to client inquiries around the clock.

Financial market and anti-money laundering rules are two areas where AI is being utilized to assure compliance. For instance, artificial intelligence (AI)-powered systems are being used to track financial transactions for indicators of fraud.

Artificial intelligence (AI) has the potential to dramatically alter the financial services industry by enhancing its speed, precision, and safety. The banking sector might greatly benefit from the application of artificial intelligence (AI), but this integration is still years away and faces a number of obstacles. Such challenges are:

To train and function, AI systems need access to massive amounts of data. This information could be utilized to observe and anticipate the behaviour of individuals. Data privacy and security are at risk because of this.

Artificial intelligence (AI) systems can be prejudiced if they are taught with biased data. As a result, some people may be treated unfairly because of their race or religion. The inability to interpret the reasoning behind AI system decisions is known as "interpretability." This can make it hard to put your faith in AI systems and to make ethical use of them.

Despite these barriers, AI shows promise for making a major influence in the financial industry. To guarantee that AI is used for good and not evil as it advances, it will be crucial to work to address these concerns.

**Some current applications of AI in the financial industry are as follows:**

**Bank of America:** The bank is employing AI to spot suspicious financial transactions. The bank uses AI to detect fraudulent transactions with 99% accuracy, for instance.



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**Capital One:** Capital One uses artificial intelligence for risk analysis. For instance, the bank's AI-driven system has an 85% success rate in identifying loan-defaulting customers.

**BlackRock:** BlackRock uses AI for portfolio management. The asset manager's AI-driven approach, for instance, can pick out undervalued equities with a 75% success rate.

JPMorgan Chase is utilizing AI in its customer care department. The bank's chatbot, for instance, is driven by AI and can respond to consumer inquiries around the clock with a 95% accuracy rate.

Wells Fargo: Wells Fargo is utilizing AI to meet regulatory requirements. For instance, the bank's AI-driven technology can spot red flags in customer transactions 98% of the time.

These are just a handful of the many applications of AI in the financial industry. More and more creative uses of AI are likely to appear in the financial services sector as the field of AI progresses.

Sustainability and environmental protection are two areas where artificial intelligence is being put to use. Artificial intelligence (AI)-driven systems, for instance, can now observe deforestation, keep tabs on pollution levels, and forecast natural disasters.

There are many ways in which the field of environmental sustainability is being revolutionized by artificial intelligence (AI). Some of the most noticeable effects of AI on the natural world include:

Monitoring air, water, and soil pollution: Artificial intelligence is being utilized to create new monitoring tools. This information can be used to pinpoint problem locations and formulate plans to cut down on pollution.

New solutions for more effective waste management are being developed with the help of AI. This involves coming up with novel approaches to waste management, such as reducing waste generation and expanding current recycling and composting infrastructure.

New solutions to counteract and adapt to climate change are being created with the help of artificial intelligence. New methods of generating renewable energy and safeguarding against climate-related hazards like floods and droughts are two examples of what needs to be done.



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New solutions for the sustainable management of natural resources are being developed with the help of AI. Methods for reducing the negative effects of human activities on natural resources and for tracking and monitoring their use are among the areas that need to be explored.

Artificial intelligence (AI) has the potential to significantly impact the fight against climate change by revolutionizing environmental protection and sustainability. However, it is crucial to remember that AI is still in its infancy, and that several obstacles must be overcome before AI can be fully integrated into the environmental protection system. Examples of such difficulties are:

Artificial intelligence (AI)-based systems can be pricey to create and roll out.

Accuracy: It is essential that AI-based technology be trustworthy and accurate.

Artificial intelligence (AI) powered technologies must lack bias.

Policymakers and environmentalists alike must be open to the idea of using technologies powered by artificial intelligence.

Despite these limitations, AI has great promise for improving ecological conditions. To guarantee that AI is used for good and not evil as it advances, it will be crucial to work to address these concerns.

**Some current applications of AI in environmental safeguarding include the following:**

To monitor environmental changes, Google has developed a platform called Google Earth Engine, which use artificial intelligence to sift through satellite images and other data. The impacts of climate change, forest loss, and wildfires have all been studied with the help of Google Earth Engine.

IBM Watson for Sustainability is a set of AI-powered technologies designed to assist organizations in lowering their negative effects on the environment. Businesses have utilized IBM Watson for Sustainability to cut back on their energy usage, increase their water efficiency, and decrease their trash output.

The Microsoft Sustainability Accelerator is a grant and mentorship program for early-stage companies working on environmentally protective technology that are powered by artificial intelligence.

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Companies working on pollution monitoring, waste management, and climate change mitigation have received funding from Microsoft's Sustainability Accelerator.

Just a few of the many ways AI is changing the world today are listed above. In the years to come, we may anticipate even more creative and consequential uses of AI technology.

### **Here are some of the challenges and opportunities associated with AI:**

#### **Challenges:**

The fact that AI systems can be biased is one of the challenges that we face. This is due to the fact that kids are taught using data that is obtained from the real world, which can reflect existing biases in the world. For instance, if an artificial intelligence system is trained on a dataset of resumes that are predominantly from men, it may be more likely to propose men for positions than it would be to recommend women.

Another challenge is that AI systems are vulnerable to being hacked. This is due to the fact that they are complicated and include a great deal of information. If an artificial intelligence system is hacked, it may be used to steal data, propagate false information, or even do bodily harm.

Lastly, the development and deployment of AI systems can be too expensive. This is due to the vast amounts of data, computational power, and skill that are required for them.

#### **Opportunities:**

One possibility is that AI might be utilized to find solutions to some of the most important issues that the world faces today. For instance, AI can be applied to the creation of new medicines and treatments for diseases, the enhancement of healthcare services, and the improvement of the safety and efficiency of transportation.

Another possibility is that AI will result in the creation of brand new work opportunities. For instance, in the years ahead, there will be an increased demand for data scientists, engineers, and technicians who are able to design and manage AI systems.

Last but not least, AI has the potential to make our lives better overall. For instance, artificial intelligence can be used to make personalized recommendations, automate jobs, and even develop new forms of entertainment.

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In general, artificial intelligence (AI) is a potent technology that has the potential to change the world. However, in order for us to make responsible and ethical use of AI, it is essential for us to be knowledgeable about the difficulties and opportunities that are linked with it.

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