

Chapter 2: AI in Industries

Imagine waking up in the morning and asking your phone to check the weather. It answers right away. A navigation app tells you which route to take to go to school to avoid traffic. A learning app can assist you in solving a difficult math problem. A doctor uses a smart machine to monitor a patient's health. Artificial Intelligence (AI) makes all of these things possible.

AI is not just a technology idea; it is a powerful tool that changes how things work in the world. AI is helping people make better decisions and live better lives in many places, such as at home, in schools, on the road, and on their phones.

AI and Healthcare

When someone is sick, we depend on hospitals and doctors to help them get better. Today, AI is working with medical professionals to improve healthcare by making it faster, safer, and more accurate.

Use of AI in Hospitals and Medicine

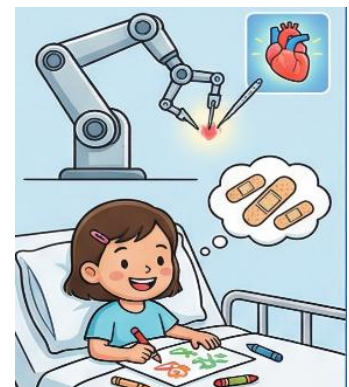
AI-powered machines and devices in modern hospitals help doctors examine patients more closely. AI models can look at X-ray or MRI images and quickly point out areas that show problems. Doctors may be able to find infections and tumours much earlier than they have been able to in the past, which could save thousands of lives.

Some patients have smart devices like fitness bands and health apps that record heart rate, steps, and sleep. These devices monitor health information and alert the user if something appears abnormal. If a user's heart rate becomes irregular, the device could recommend visiting the doctor right away. Robotic surgeries make complex surgeries safer and shorten the time it takes for patients to heal.



Case Study: Precision in Heart Surgery

A young girl had to undergo heart surgery. Usually, this kind of surgery would need large incisions and a long time to heal. Instead, doctors used an AI-assisted robotic system. The AI helped steady the surgeon's hands by removing even the smallest natural shaking. Three small cuts were used to perform the surgery. A few days later, the girl was sitting up and drawing with crayons. **AI did not do the surgery by itself; it helped the doctor do it in a safer and gentler way.**



Improving Accuracy and Decision-Making

AI can read thousands of medical reports in just a few seconds. A medical professional could spend hours or days examining so much data. AI can quickly compare the symptoms of a patient with global medical data and recommend treatment options.

If a patient somewhere has an unusual illness, AI systems will be able to go through the medical records of patients in the world to find others with similar illnesses and see what worked best. This leads to better decision-making and fewer errors. Support from AI enables doctors to spend more of their time on patient care and less time searching out potentially unknown research findings.

AI in Education

AI is making education smarter and more engaging. Today students no longer limit themselves to textbooks and traditional classroom settings. They can have access to innovative ideas through a digital medium, which is interactive in nature and conducive to learning.

AI in Teaching and Learning

AI is powering many educational apps and websites that are now available to students in new and engaging ways. These sites teach through videos, quizzes, and games. When a student responds to a question, the system immediately checks it and provides feedback.

Teachers also use the tools to keep track of how students are doing and grade their work. Teachers do not have to spend as much time grading papers, which means they can spend more time helping students learn concepts better.

For example, web-based applications such as digital learning platforms make it easy for teachers to share notes, assign homework, and interact with students.



Learning Support

AI-powered learning apps help students who find subjects like mathematics difficult by providing simpler explanations and additional practice problems. Students who learn the concepts quickly are given more challenging and customised tasks to keep them engaged and motivated. This approach helps students develop a greater self-confidence and love of learning.

Case Study: AI-based online class reminders.

Meet Aisha, a 10-year-old girl who often forgot to attend her online classes on time and missed important lessons. To solve this problem, her school introduced an AI-based reminder system.

The system learned her class schedule and sent timely reminders before each session. It also adjusted the notifications based on her daily routine. As a result, Aisha began attending classes regularly and showed improvement in her learning and overall performance.



AI did not just send reminders, but it built a regular learning habit for Aisha.

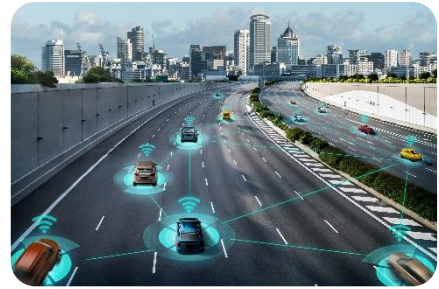
AI in Transport

Have you ever wondered how navigation programs determine the fastest route to a destination? The answer is artificial intelligence.

The Role of AI in Transport Sector

AI is used by traffic control systems to keep busy roads safe. Sensors and cameras keep track of how many cars are on the road. AI looks at this data and then controls the traffic lights to make traffic flow better, reduce congestion and prevent sudden braking.

AI helps navigation apps find the quickest way to get to your destination. If there is traffic or an accident, the app instantly recommends a new way. This feature saves time and fuel. For example, self-driving car companies have developed vehicles that can see obstacles, read traffic signs, and help drivers.



Improving Safety and Efficiency

The AI technology also helps to prevent accidents by minimizing the chances of human error. The cars can alert and slow down if the driver is distracted. Public transport systems also use AI to maintain schedules. Buses and trains run on time because AI helps plot routes and track delays. This kind of technology takes people off crowded roads with grinding traffic and lets them travel in peace to their destinations.

Case Study: Smarter Traffic During Monsoon

During the monsoon season, heavy rains in Mumbai frequently cause traffic congestion. An AI traffic system analysed weather information and traffic patterns. Drivers use navigation devices to find other routes before heavy rain begins. AI began adjusting traffic patterns in anticipation of heavy rain. As a result, traffic during heavy rains improved significantly. **AI used historical and real-time data to anticipate congestion and optimise the system.**



AI in Communication

Communication is an important part of our daily life. With the help of Artificial Intelligence, it has become faster, easier, and more efficient.

Email services and messaging apps are leveraging AI to sort through messages, including blocking spam mails. This prevents the loss of important messages. Voice assistants respond to voice commands by answering questions and sending messages. Translation tools help people understand different languages quickly. This makes it easy for people from different countries to communicate.

Video platforms use AI to recommend videos that viewers are likely to watch, based on the kinds of videos they already prefer. This helps users find useful and interesting content.



Faster and Better Information Exchange

AI enables the rapid flow of information around the world. It enhances sound and video quality during online classes or meetings. Background noise is reduced, and the voice becomes much clearer. For example, if students are taking an online class at home, then Artificial Intelligence can help reduce background noise so they can hear the teacher clearly. AI enhances communication tools to keep people constantly connected and informed.

Case Study: AI in a Rescue Mission

A rescue ship in the sea got distress calls in various languages all within minutes during an emergency. The rescue team did not know how to speak all of these languages. The messages were quickly translated by an AI system. It even detected the speakers' fear and urgency. The system warned that one person sounded extremely distressed. The rescue team saved the boat by reaching in time.

AI did more than translate words; it helped save lives.



Advantages of Using AI in Different Industries

Several Industries have been benefitted by Artificial Intelligence as it helps them improve their efficiency. AI is not taking away the jobs, it is helping in increasing productivity. Hospitals, banks, factories etc., are improving their quality of work by using AI



Saves Time and Increases Work Speed

AI is remarkably good at carrying out repetitive tasks. AI systems can also work nonstop without getting exhausted or bored to complete any task in time.

Reduces Costs

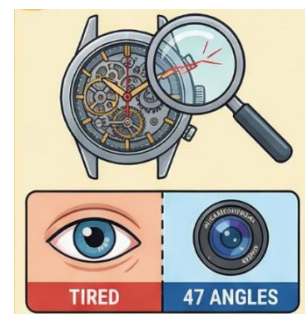
Efficient planning of work for any business saves money and AI assists in that. It can help in avoiding costly machine breakdowns by identifying issues in time. It also helps control stock and energy use, which diminishes waste.

Improves Quality

Artificial Intelligence is supportive in improving the quality of product and services. It helps in checking items carefully and in detecting even small imperfections, leading to more reliable results.

Case Study: Ensuring Perfect Quality

Human eyes may get tired using magnifying glasses to look at small gears in a watch factory. Human inspectors missed about 3% of defects. An AI high-resolution vision system now checks each gear from 47 different angles and compares it to millions of perfect samples. It once found a scratch so small that it was only one-hundredth the width of a human hair! For an athlete who needs to be on time, even seconds matter.



AI makes sure that things are right when they need to be perfect.

Helps in Better Decision Making

Artificial intelligence can quickly process large amounts of data. It will find patterns and make relevant suggestions. AI helps businesses and other organisations make informed decisions and plan for the future.

Better customer service

Many organizations are developing AI chatbots and virtual assistants. Customers receive quick responses from AI, allowing them to get help without waiting in long lines. In addition, AI recommends products that customers may need, providing a more convenient shopping experience.

Improves safety

AI monitors workplace environments and alerts personnel to potential hazards. It also helps secure information online by detecting fraud and identifying hacking attempts. This helps protect businesses.

Case Study: AI Inspires New Designs

An AI system, while studying thousands of patents noticed something unusual. The shape of bird wings and certain ship designs had similar patterns. A new ship design with tender wing-like curves is suggested by AI. This reduced water resistance by 18%. It has helped in supplying medical equipment and medicines to remote islands faster and with less fuel in these ships.

AI connects ideas from different fields and helps humans develop better solutions.



Points to remember:

- ✓ Artificial Intelligence (AI) is a powerful tool that helps industries work quicker, smarter, and more proficiently.
- ✓ AI is used in many areas such as healthcare, education, transport, communication, and business.
- ✓ In education, AI provides personalised learning by adjusting lessons according to a student's learning pace and ability.
- ✓ AI improves transport systems by managing traffic lights, predicting congestion and suggesting faster routes.
- ✓ AI improves communication by filtering spam emails, translating languages and enhancing audio and video quality.

Exercise

A. Multiple Choice Questions.

1. Artificial Intelligence mainly helps industries to become:
 - a) Traditional
 - b) Efficient
 - c) Slow
 - d) Manual
2. In healthcare, AI mainly helps in:
 - a) Diagnosis
 - b) Advertising
 - c) Packaging
 - d) Decoration
3. In education, AI provides:
 - a) Cancelling classes
 - b) Personalised learning
 - c) Reducing learning
 - d) Extra homework
4. In transport systems, AI is used to:
 - a) Manage traffic
 - b) Increase traffic congestion
 - c) Stop route planning
 - d) Remove public transport
5. AI supports better decision-making by:
 - a) Ignoring available data
 - b) Analysing large amounts of data
 - c) Making random guesses
 - d) Avoiding pattern recognition

B. Fill in the blanks.

1. AI-powered machines help doctors detect diseases at an _____ stage.
2. Robotic surgery can make complex operations _____ and reduce recovery time.
3. AI learning programs can understand how each student _____ best.
4. Traffic control systems use _____ and cameras to monitor vehicles on roads.
5. AI translation tools help people understand different _____.

C. Short answer questions.

1. How does AI help in healthcare?
2. Explain how AI supports personalised learning in education.
3. How does AI improve transport systems?
4. Mention two advantages of using AI in industries.
5. How does AI improve customer service?

D. True or False:

1. AI can help doctors detect diseases at an early stage.
2. AI completely replaces teachers in classrooms.
3. AI helps traffic systems manage congestion.
4. AI cannot analyse large amounts of data quickly.
5. AI improves communication by reducing background noise in online meetings.

E. Identify the AI Applications.

AI APPLICATION	FIELD
Analysing MRI scans	
Giving instant quiz feedback	
Controlling traffic lights	
Blocking spam emails	
Managing inventory and energy use	

