



# **KS Rangasamy**

**College of Arts and Science**

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## **Digital Commerce and Sustainable Development Goals on Industry, Innovation and Infrastructure**



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## ROLE OF AI AND EMERGING TECHNOLOGIES

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### Abstract

Artificial intelligence (AI) is a set of technologies that enable computers to perform a variety of advanced functions, including the ability to see, understand and translate spoken and written language, analyze data, make recommendations, and more. Artificial intelligence is a field of science concerned with building computers and machines that can reason, learn, and act in such a way that would normally require human intelligence or that involves data whose scale exceeds what humans can analyze. Artificial intelligence is a subfield of computer science that focuses on creating intelligent agents capable of performing tasks that would typically require human levels of intelligence. These tasks include problem-solving, speech recognition, and decision-making, among others. The role of artificial intelligence has created a massive impact on all sectors of the world. Shortly, it will be more rapidly expanding to mark its significance for shaping the world.

**Keywords:** *Artificial intelligence, Technology, Intelligence.*

### 1.Introduction

AI is the backbone of innovation in modern computing, unlocking value for individuals and businesses. For example, optical character recognition (OCR) uses AI to extract text and data from images and documents, turns unstructured content into business-ready structured data, and unlocks valuable insights. AI is a broad field that encompasses many different disciplines, including computer science, data analytics and statistics, hardware and software engineering, linguistics, neuroscience, and even philosophy and psychology. On an operational level for business use, AI is a set of technologies that are based primarily on machine learning and deep learning, used for data analytics, predictions and forecasting, object categorization, natural language processing, recommendations, intelligent data retrieval, and more.

The possibilities of AI are endless, and it's not surprising that company from all kinds of sectors and industries are integrating AI technologies to optimize their business processes and support decision-making. The high popularity of new technologies in AI impacts all industries of life. Healthcare, education, finance, retail, and many more spheres that we face every day. The finance industry uses AI-powered algorithms to improve risk assessment, detect fraud more effectively, and enhance customer service. Retail and ecommerce utilize new technologies in AI for demand forecasting, personalized marketing strategies, and optimizing supply chain



operations. All in all, before discussing the new technologies in AI, let us show you some more statistical information that helps better understand the tendencies in the development of the AI industry. Designing computer systems to make intelligent decisions based on context rather than direct input is generally referred to as artificial intelligence. It's critical to realize that

## 2. Goals of Artificial Intelligence

AI has clear goals that guide its development. Here are the most important ones:

- **Efficiency and Automation:** Make tasks faster and free people from repetitive work.
- **Better Decision-Making:** Use data to help in making smart choices, whether for businesses or personal needs.
- **Supporting People:** Work with humans to improve their abilities and help them achieve more.
- **Personalized Experiences:** Understand what people like and provide customized services.
- **Being Responsible:** Create fair systems, respect privacy, and follow ethical standards.
- **Helping Society:** Use AI to tackle global challenges, like improving healthcare or protecting the environment.

### Future Trends in AI Technology

As we look towards the future, the importance of AI is set to grow exponentially. With AI technologies evolving at a rapid pace and their applications expanding across various sectors, AI will continue to be a critical skill for individuals, businesses, and societies.

## 1. AI and IoT integration

AI and the Internet of Things (IoT) are two intimately united concepts in several domains. IoT refers to the digital interconnection between multiple (tech) physical systems. Smart homes and smart cities are examples of IoT systems. The symbiotic relationship between AI and IoT enhances smart interactions with the physical environment by collecting different types of sensory data and processing them to make human-like decisions in such an environment autonomously.

## 2. AI in edge computing

AI often relies on **remote cloud servers** for its heavy lifting. This could change with edge computing. **Edge AI** is the practice of deploying AI models and algorithms directly on edge devices, which are devices located at the network's periphery, close to where data is generated and actions need to be taken.

Recent advancements in AI, such as the development of smaller and more efficient language models like **GPT-4o Mini**, **Llama 3.1 8B**, and **Gemma 2 2B**, are further accelerating the adoption of edge AI.

## Emerging AI Technologies

AI is a cornerstone technology for digital transformation and a critical enabler for emerging technologies, such as quantum computing, autonomous systems, and robotics. Artificial Intelligence (AI) and emerging technologies cover a wide range of advanced tools and systems. These are designed to imitate, enhance, or go beyond what humans can do. At its core, AI includes:

1. **Machine Learning**, where algorithms improve through experience without explicit programming.
2. **Robotics** is about creating robots that can perform tasks usually done by humans, using human-like intelligence.
3. **The Internet of Things (IoT)**, which connects everyday devices to the internet to collect and exchange data.

Also, technologies such as augmented reality (AR) and blockchain are included in this broad category. AR changes the way we see and interact with digital information, while blockchain helps make transactions more secure.

## AI Impact in Industries

There's virtually no major industry that modern AI hasn't already affected. Here are a few of the industries undergoing the greatest changes as a result of AI.

### AI in Manufacturing

Manufacturing has been benefiting from AI for years. With AI-enabled robotic arms and other manufacturing bots dating back to the 1960s and 1970s, the industry has adapted well to the powers of AI. These industrial robots typically work alongside humans to perform a limited range of tasks like assembly and stacking, and predictive analysis sensors keep equipment running smoothly.

### AI in Healthcare

It may seem unlikely, but AI healthcare is already changing the way humans interact with medical providers. Thanks to its big data analysis capabilities, AI helps identify diseases more quickly and accurately, speed up and streamline drug discovery and even monitor patients through virtual nursing assistants.

### AI in Finance

Banks, insurers and financial institutions leverage AI for a range of applications like detecting fraud, conducting audits and evaluating customers for loans. Traders have also used machine learning's ability to assess millions of data points at once, so they can quickly gauge risk and make smart investing decisions.



## AI in Education

AI in education will change the way humans of all ages learn. AI's use of machine learning, natural language processing and facial recognition help digitize textbooks, detect plagiarism and gauge the emotions of students to help determine who's struggling or bored. Both presently and in the future, AI tailors the experience of learning to student's individual needs.

### 3. Challenges

Whether or not companies have started to explore AI, there are definite concerns and challenges with implementing the technology. Topping the list is a fear that might be fueled by sci-fi depictions: a lack of insight into AI decision-making. This worry is higher outside the IT function 40% of executives and 44% of non-IT employees are concerned about this area compared to just 36% of IT workers. This is a good opportunity for technical specialists to lend their expertise to business discussions. The tables turn when it comes to the second challenge. Consumer technology has helped create a perception that complex systems have minimal support requirements.

### 4. Conclusion

Undoubtedly, AI is a revolutionary technology. A growing number of businesses from the IT sector and beyond are already adopting it to improve practices, make better decisions, and build emerging technologies. As these systems become smarter, companies with a solid grasp of AI fundamentals are likely to hold a significant edge over their competition. Request a demo of how DataCamp can guide you through the process of upskilling your entire team and building a data-positive culture. AI has, however, undoubtedly transformed the lives of people in society. The algorithms of AI have to be built to be aligning the overall goals of that of humanity.

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