


# Chapter 7

## Healthcare in the Era of AI: Ethical Considerations, Challenges, and Future Trends

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### **ABSTRACT**

*AI has the potential to fundamentally transform healthcare delivery and revolutionize the sector with applications such as precision diagnosis, personalized treatment plans, remote patient monitoring, and drug discovery. The chapter commences with a brief introduction and historical overview of AI. The second segment focuses on the current status of AI in healthcare. The third segment delves into its legal and ethical considerations, while the fourth addresses the challenges that must be overcome for successful AI integration. Lastly, future trends in AI implementation within healthcare are discussed. Resolving these implementation barriers requires a collaborative effort among clinicians, technologists, regulators, and policymakers.*

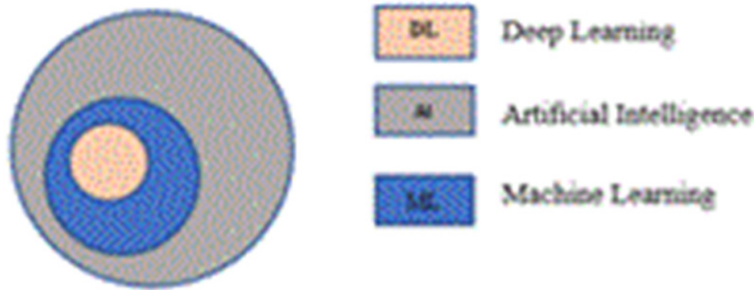
### **1. INTRODUCTION**

Artificial intelligence (AI) refers to machines that simulate cognitive process that people form mental associations with one another, like problem solving and learning. Artificial Intelligence (AI) aims to develop systems that can replicate

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human intelligence by using datasets to solve problems, process them, and learn from the past. (Tableau, n.d.).

Figure 1. AI content



AI is a broad term, including machine learning and deep learning. AI uses different algorithms for different tasks. Based on the task, different algorithms are used. Definition of artificial intelligence (AI) by (Lavanya,2021) can be found at the end of the chapter. There are three types of learning: supervised, non-supervised, and reinforcement. (Coursera,2024). Feeding a machine with a large chunk of data is part of machine learning in order to learn and make predictions, identify patterns, and categorize data. Supervised learning uses algorithms like support vector machines, neural networks, decision trees, and linear regressions. In this type, machines are supervised while learning, hence the name. Unsupervised machine learning makes use of Gaussian mixture models, K-means, hidden Markov models, and hierarchical clustering algorithms that do not use the same labeled training data. Whereas the reinforcement type makes use of Q learning, Monte Carlo, Sarsa algorithm, which is based on the trial-and-error method, to obtain the desired result. In short, it is based on actions and rewards. (Simplilearn, n.d.). The three types of AI based on capacities are classified into super AI, general AI, and narrow AI. Narrow AI, called as weak AI, is meant for particular tasks or a range of tasks generally used in speech or facial recognition. Alexa, IBM's Watson, Open AI's ChatGPT are examples of weak AI. Whereas general AI or strong AI, can carry out any intellectual work that humans can perform, which is still a theoretical concept. AGI, which is artificial general intelligence based on previous learning, can perform new tasks without any human assistance to train the model. Like AGI, super AI is strictly theoretical. Applications based on super AI capacities will have sentiments, emotions, beliefs, and desires like humans (IBM,2024).

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