Chapter 1
1956 Artificial Intelligence Is Born

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ABSTRACT

The Dartmouth Conference held in 1956 marks the official birth of the field of artificial intelligence (AI). This meeting brought together pioneering scientists such as John McCarthy, Marvin Minsky, Claude Shannon, and Nathaniel Rochester to explore the question "Can machines think?" from an interdisciplinary perspective. The term "artificial intelligence" was used for the first time at this conference, and the idea that machines could imitate human-like intelligence was proposed. Prior to this, significant theoretical foundations had been laid by figures like Alan Turing, particularly with the "Turing Test," along with developments in logic, computability, neural network models, and cybernetics. The use of AI in home healthcare began with these foundational conceptual studies in the 1950s and has since evolved into today's integrated solutions, combining clinical decision support systems, remote monitoring technologies, wearable devices, social robots, and smart home innovations.

1. INTRODUCTION

By the mid-twentieth century, the question "Can machines think?" had become a fundamental issue engaging both scientists and philosophers. Understanding history is not merely about exploring the past—it is also essential for anticipating future innovations and opportunities. The core dynamics that have driven technological progress for decades tend to persist in similar patterns, and development often unfolds along recognizable trends. In this context, gaining insight into the historical

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evolution of artificial intelligence is particularly important for comprehending both the current role and future potential of AI in home healthcare services.

In 1950, the British mathematician Alan M. Turing directly tackled this question in his seminal article "Computing Machinery and Intelligence," proposing an experimental game—now known as the Turing Test—to determine whether a machine could be considered intelligent (Turing, 1950). Rather than asking "Can machines think?" Turing suggested assessing "whether the behavior of a machine is indistinguishable from that of a human being" through an "imitation game," thereby transforming the debate into a concrete test (Turing, 1950). During this period, Turing and other pioneering thinkers advanced the idea that the human mind could be understood through mathematical and information-processing models and that computers might perform complex cognitive tasks.

The 1950s witnessed the advent of digital computers and a rapid increase in computational power. Electronic machines developed during World War II demonstrated the potential to mechanically replicate human abilities in calculation and logical reasoning. These technical advances fueled optimism that "human intelligence could be modeled algorithmically." Concurrent research in cybernetics (Wiener, 1948) and automata theory investigated feedback control mechanisms and the theoretical foundations of computation, while McCulloch and Pitts (1943) argued that neurons in the human brain could be modeled as simple logical gates. Collectively, these efforts laid the conceptual groundwork for what would become artificial intelligence. However, at that time, the label "artificial intelligence" had not yet been coined; researchers referred instead to "thinking machines," "automatic machines," or "information-processing systems" (McCarthy, Minsky, Rochester, & Shannon, 1955).

In 1956, a workshop was convened at Dartmouth College in the United States, where these disparate ideas were brought together under a single roof, thus symbolizing the birth of a new research field. The Dartmouth Summer Research Project on Artificial Intelligence, as it became known, represented the first official use of the term "artificial intelligence" and was tasked with defining the discipline's boundaries. In this chapter, the conference's preparation, content, participants and initial outcomes are examined. Subsequently, the rapid developments and challenges of the late 1950s and 1960s are analyzed—particularly how criticism was provoked by the field's overoptimistic expectations and how funding was curtailed during the so-called AI winters". Finally, the lasting impact of the 1956 beginnings on the current state of AI and the development of AI in healthcare will be evaluated.