


# Adoption of AI Services Based on the Technology Acceptance Model: A Meta-Research Approach

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## ABSTRACT

Rapid advancements in artificial intelligence (AI) have expanded its applications across industries, including chatbots, image recognition, speech processing, finance, and manufacturing, enhancing competitiveness and quality of life. The release of ChatGPT 3.5 in November 2022 was a turning point, accelerating information and communication technology transformation. This study identifies key factors influencing AI service adoption and diffusion using the technology acceptance model (TAM). Through a comprehensive literature review, it examines AI service frameworks, extracts determinants of user acceptance, and proposes an artificial intelligence service technology acceptance model, an extension of TAM tailored to AI contexts. Findings show that individual characteristics, system attributes, and social influence shape perceived usefulness, ease of use, enjoyment, and risk, which directly affect adoption and diffusion. The research extends the TAM for AI services and provides practical guidance for organizations and individuals to integrate AI into business and daily practice.

## KEYWORDS

AISTAM, TAM, AI Services, Personal Characteristics, Technological Attributes, Social Influences, Perceived Characteristics

## INTRODUCTION

Artificial intelligence (AI) services have advanced rapidly and are now widely applied across a range of industries, including AI-powered chatbots, image and speech recognition, healthcare, finance, manufacturing, retail, education, gaming, smart homes, autonomous driving, and robotics. The increasing integration of AI services is expected to enhance organizational competitiveness and improve the quality of life significantly. In particular, the launch of generative AI (e.g., ChatGPT) in November 2022 has expanded the possibilities of AI applications. With its ability to generate text, images, speech, and video content, generative AI is poised to drive innovation across multiple sectors.

According to *MarketsandMarkets* (2022), the global AI services market is projected to grow from USD 150.2 billion in 2023 to USD 1.3452 trillion by 2030, reflecting a nearly ninefold increase. Especially in domains such as healthcare, the compound annual growth rate is expected to exceed 42% (Fortune Business Insights, 2025). This indicates a steep upward trend in AI service adoption. A

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report by IDG TechLibrary Korea (2023) also reveals that 4 out of 10 Korean companies have either implemented or are in the process of adopting AI services, signaling that AI services are becoming essential for corporate operations. However, a closer examination shows that 76.7% of companies primarily use commercially available solutions such as ChatGPT and Microsoft's AI offerings, suggesting that actual AI adoption remains concentrated in a limited range of services.

Despite the strong market potential, the types of AI services that companies are currently implementing remain narrow in scope. As such, there is a pressing need for companies to conduct in-depth analysis and evaluation of the AI service market to inform their adoption strategies. Previous studies have largely focused on specific service types (e.g., chatbots, AI speakers, and generative AI), and comprehensive research addressing AI services as a unified framework is still lacking. Furthermore, existing research tends to propose only a limited set of influencing factors for AI adoption, without sufficiently considering the characteristics of service providers (i.e., system attributes) or users (i.e., personal characteristics).

Therefore, this study proposes the artificial intelligence service technology acceptance model (AISTAM) as a conceptual extension of the technology acceptance model (TAM), specifically tailored for AI service adoption and grounded in a structured review of existing literature. The proposed model is intended not as an empirical test but as a conceptual foundation for future validation, with methodological pathways such as survey development and structural equation modeling suggested for subsequent research. In particular, the study identifies and categorizes the key external determinants—personal, technological, and social factors—that influence perceived characteristics, the core constructs of the TAM. At the same time, it acknowledges that adoption drivers may vary across different categories of AI services (e.g., generative AI, predictive AI, and robotics).

## BACKGROUND

### Technology Acceptance Model

The TAM, initially proposed by Davis (1986), is a theoretical framework designed to explain users' acceptance of new technologies by examining their perceived characteristics. The model identifies motivationally driven perceptions as the key determinants of technology adoption. According to Davis, system features (design attributes) influence users' cognitive responses—namely, *perceived usefulness* and *perceived ease of use*—as well as their affective responses, such as *intention to use*. These, in turn, drive *behavioral responses*, leading to actual system usage. In essence, the TAM provides a foundation for understanding the factors that influence an individual's willingness to accept and use a new technology.

Davis (1986) defined perceived usefulness as “the degree to which a person believes that using a particular system would enhance their job performance” and perceived ease of use as “the degree to which a person believes that using a system would be free of effort.” Building upon this foundational model, Venkatesh and Davis (2000) introduced TAM2, which incorporates additional factors such as the theory of reasoned action, image, and result demonstrability. Later, Venkatesh and Bala (2008) proposed TAM3, further expanding the model to include system characteristics, individual differences, social influences, and facilitating conditions as external variables. Subsequent studies have proposed various extended TAM frameworks to better capture the complexity of technology adoption in specific domains (e.g., J. S. Hwang & Lee, 2016; K. S. Lee et al., 2020; J. H. Oh, 2021). As such, the TAM and its extensions have been widely utilized in the field of information and communication technology to investigate users' acceptance behavior toward emerging digital services and platforms.

### Artificial Intelligence Services

The term *artificial intelligence (AI)* was first introduced in 1956 during a landmark conference at Dartmouth College, initiated by McCarthy, Minsky, Rochester, and Shannon. According to the National

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