

THE ROLE OF ARTIFICIAL INTELLIGENCE IN HUMAN LIFE

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This scientific article examines the significant role of artificial intelligence (AI) in human life, focusing on its key cognitive features and operational mechanisms from a theoretical perspective. Additionally, the article provides insights into the origin, development stages, and current state of artificial intelligence

Introduction

Artificial intelligence refers to systems capable of processing data, analyzing experiences, deriving outcomes, and learning from them to improve their performance. AI can solve complex tasks similarly to humans, understand and respond to natural language, and perform various operations without human intervention, such as through robotic or software systems.

Despite rapid technological advancement, a comprehensive understanding of AI's operational mechanisms, cognitive features, and societal implications remains limited. This study aims to bridge this gap by providing a theoretical and applied analysis of AI in human life.

This paper is structured as follows: the next section presents the literature review, followed by methods, results, and discussion.

Literature review

The concept of artificial intelligence emerged in the mid-20th century following the invention of programmable computers (Turing, 1950). Early visions of intelligent machines were proposed by pioneers such as Alan Turing, who introduced the Turing Test to evaluate a machine’s ability to exhibit human-like intelligence.

The formal establishment of AI as a scientific discipline occurred during the Dartmouth Summer Research Project in 1956, organized by John McCarthy and colleagues. This event marked the beginning of AI research as an academic field, and the term “artificial intelligence” was coined. Early AI systems, such as ELIZA, a chatbot simulating human conversation, and Shakey the Robot, capable of environmental analysis, demonstrated initial problem-solving capabilities. However, technological limitations led to intermittent funding and periods known as “AI winters” (Zayniddinov et al., 2018).

Later developments, including expert systems in the 1980s and advances in machine learning, revived AI research, culminating in notable achievements such as IBM’s Deep Blue defeating a chess grandmaster in 1997 (Bekmuratov, 2021).

Recent studies emphasize machine learning and neural networks as the core technologies enabling modern AI systems (Zayniddinov et al., 2018; Bekmuratov, 2021). AI systems are capable of processing vast datasets, recognizing patterns, and improving performance over time. However, most studies focus on technical development, leaving a gap in the integration of cognitive features, operational processes, and societal impact, which this study aims to address.

Methods

This study employs a **qualitative and theoretical research approach** based on the analysis of secondary data sources. Relevant academic books, scientific articles, and historical records related to artificial intelligence were systematically reviewed.

The research methodology consists of the following stages:

- **Data Collection:** Academic literature, including books and research papers on AI, machine learning, and robotics, was collected.
- **Data Analysis:** The collected materials were analyzed using a comparative and descriptive approach to identify key concepts, patterns, and developments in AI.
- **Thematic Organization:** The findings were categorized into major themes such as the working mechanisms of AI, its historical development, and its practical benefits.

This method allows for a comprehensive understanding of artificial intelligence from a theoretical perspective without relying on experimental or quantitative data.

Results

The analysis of the collected literature reveals several key findings:

1. Artificial intelligence operates through a structured process that includes data collection, pattern recognition, model development, and continuous improvement.
2. Machine learning and neural networks are identified as the fundamental technologies enabling AI systems to function effectively.
3. AI has significantly evolved from theoretical concepts in the mid-20th century to practical applications in modern industries.
4. The implementation of AI has led to increased efficiency, reduced human error, and enhanced productivity across multiple sectors such as healthcare, finance, transportation, and manufacturing.
5. AI systems demonstrate the ability to perform complex tasks, including natural language processing, decision-making, and predictive analysis.

For example, just as a child gradually learns to recognize a cat through repeated exposure, AI systems learn from vast datasets to identify objects or events efficiently (Zayniddinov et al., 2018; Bekmuratov, 2021).

Discussions

The findings indicate that AI is an essential component of modern technological development. AI systems function not only as automation tools but also as adaptive systems capable of learning and improving over time.

Implications:

- AI replicates aspects of human cognition, such as learning, reasoning, and problem-solving, while processing data faster and at larger scales.
- Widespread AI adoption reduces human error, enhances productivity, and automates repetitive tasks, freeing humans for more complex decision-making.
- Ethical and social considerations, including job displacement, data privacy, and decision-making accountability, remain critical challenges.

Comparison with previous research:

The study aligns with Zayniddinov et al. (2018) and Bekmuratov (2021), confirming that AI improves operational efficiency and accelerates research across industries. However, this study expands understanding by integrating AI's cognitive features and societal impact into a comprehensive framework.

Future research:

- Examining long-term societal impacts of AI deployment

- Developing ethical frameworks for AI decision-making
- Investigating interdisciplinary applications in healthcare, education, and finance

Conclusion

Artificial intelligence is increasingly integral to human life. It automates workflows, reduces human error, minimizes repetitive tasks, and enables rapid decision-making. AI significantly contributes to healthcare, industry, transportation, finance, scientific research, and communication. Modern AI systems, utilizing artificial neural networks, deep learning, and big data, solve complex problems and enhance human productivity. AI is poised to continue accelerating innovation and improving the quality of life.

References

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5. Tip: For full Scopus journal submission, add 4–6 recent peer-reviewed AI articles to strengthen references.