The Beneficence and Maleficence of Artificial Intelligence: A Sociological Analysis of Human Dependency, Social Functions, Mental Well-Being & Emerging Challenges

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Abstract

In this modern age of technology, artificial intelligence (AI) has become an essential element of today's world, influencing education, employment, communication, healthcare, decision-making, and day-to-day human activities. AI offers significant advantages by improving efficiency, accessibility, productivity, and problem-solving, its unregulated and frequent use raises concerns about the gradual development of human dependency on artificial intelligence. This study critically examines how massive dependence on AI may affect neurological, mental, and social development and, consequently, influence social functions and human relationships. Continuous dependence on AI for information, learning, reasoning, creativity, and decision-making may encourage cognitive offloading and reduce opportunities for independent thinking, memory, critical analysis, creativity, and problem-solving. At the psychological level, excessive dependence may potentially weaken self-reliance, motivation, emotional resilience, and the capacity to cope with uncertainty and failure.

From a sociological perspective, increasing dependence on AI-mediated interaction may affect socialization, face-to-face communication, empathy, cooperation, and interpersonal relationships. It may also transform institutions such as family, education, and the workplace by reducing direct human participation in activities traditionally grounded in social interaction. However, AI is not inherently detrimental; its impact depends upon the manner, intensity, and purpose of its use. The study therefore advocates a balanced, ethical, and human-centered approach in which AI complements, rather than replaces, human cognitive abilities, emotional capacities, social interaction, and human agency.

Keywords

Artificial Intelligence, Beneficence and Maleficence, Challenges, AI Dependency, Ethics and Integrity, Privacy and Security, Cognitive Offloading.

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Introduction

The sociological evolution of human society, from the earliest humans to today's technological society, can be understood as a sequence in which changes in technology, economy, social organization, ideas, and institutions influence one another. Technological change transforms social structures and human behavior, while society simultaneously determines how technologies are developed, adopted, and used. Artificial intelligence is not simply a technological invention; it is the latest stage in a long sociological process in which humans progressively transformed their relation with knowledge, machines, institutions, and ultimately intelligence itself.

Early humans → Agricultural Revolution → Ancient civilizations → Medieval society → Renaissance → Enlightenment → Industrial Revolution → Modern society → Information society → Digital and Artificial Intelligence society.

From a sociological perspective, the development of technology began when early people used fire and stone tools to survive, which eventually made cooperation, hunting, and social organization possible. Settled settlements, population expansion, the division of work, private property, and social hierarchies were all consequences of the spread of agriculture. Later, trade, government, and cross-cultural interaction increased with the development of the wheel, writing, metal tools, and transportation networks. Farming communities were transformed into industrial and urban societies by the Industrial Revolution, which brought factories, machinery, steam power, and eventually electricity. It also created new social classes, particularly capitalists and industrial workers.

Artificial intelligence, robotics, big data, and automation are the most recent developments that have a growing impact on human interactions, employment, education, healthcare, and decision-making. Thus, changes in social institutions, culture, the economy, power, inequality, and human interaction patterns have all been intimately linked to the development of technology, from basic stone tools to artificial intelligence.

Artificial Intelligence is made-up of two words: the first one is artificial, and the second one is intelligence. Artificial refers to something made by humans, and intelligence refers to the ability to think and make decisions. Artificial intelligence is the field of computer science that focuses on creating intelligent machines that can behave like humans, think like humans, and make decisions according to the logical program stored in memory. **Alan Turing** provided the foundational and theoretical framework for modern artificial intelligence in his landmark paper published in 1950 by posing a question, "Can machines think?" **John McCarthy** was a computer scientist who introduced the term artificial intelligence in 1955. He

used this phrase in a formal proposal for the 1956 Dartmouth Summer Research Project; Artificial intelligence has many beneficence (advantages) and maleficence (disadvantages).

Beneficence and Maleficence of Artificial Intelligence

Before discussing the advantages and disadvantages of Artificial Intelligence, it is important to understand what it really is. From a bird's-eye view, Artificial Intelligence allows computers to think and learn independently. That's how we simulate human intelligence in machines to do different work.

Beneficence of Artificial Intelligence

Artificial Intelligence enhances efficiency, accuracy, and innovation across various sectors by automating tasks, providing data-driven insights, and solving complex problems.

Enhanced Efficiency and Speed

Artificial Intelligence can rapidly analyze massive datasets and conduct literature reviews, saving significant time and resources.

Improved Accuracy and Pattern Recognition

Artificial Intelligence algorithms can detect complex correlations, trends, and anomalies in data with a high degree of accuracy, reducing human error in interpretation and leading to better-informed decisions.

Automation of Mundane Tasks

Repetitive and time-consuming tasks like data entry, citation formatting, and basic statistical analysis can be automated, allowing researchers to concentrate on critical thinking and innovation.

Generation of New Hypotheses

By uncovering hidden patterns in vast datasets that might be beyond human capacity to process, Artificial Intelligence can assist researchers in generating novel hypotheses and making faster, data-driven decisions.

Handling Complex Problems

Artificial Intelligence enables the exploration of more intricate topics and provides intensive insights that might be too complex for human capacity alone, facilitating scientific breakthroughs in fields like drug discovery and genomics.

Maleficence of Artificial Intelligence

Artificial Intelligence can lead to job displacement, ethical concerns, and potential biases in decision-making processes.

Potential for Bias

Artificial Intelligence models can perpetuate and amplify existing biases present in their training data, leading to skewed results and drawing unfair conclusions if not carefully managed.

Lack of Human Intuition and Creativity

Artificial Intelligence is limited by algorithms and data, lacking the capacity for original thought, intuition, creativity, and ethical reasoning essential for high-level research.

Over-reliance and Skill Loss

Excessive use of Artificial Intelligence tools may diminish researchers' critical thinking and problem-solving skills, leading to an over-acceptance of AI outputs without sufficient scrutiny or peer review.

Security & Privacy Concerns

The use of Artificial Intelligence in research raises significant issues regarding data privacy, security, and the ethical handling of sensitive information, especially in fields like healthcare and social sciences.

Inaccurate or Deceptive Information

Artificial Intelligence can sometimes produce entirely false information known as fabricated citations, which, if not verified, can result in academic misconduct and the spread of incorrect findings.

Ethical Considerations of Artificial Intelligence

The rapid advancement of artificial intelligence (AI) brings a host of ethical considerations that need careful examination. As Artificial Intelligence systems become increasingly integrated into various aspects of society, it is crucial to address the ethical implications to ensure these technologies are used responsibly and equitably. Here are some key ethical considerations of artificial intelligence.

- Unfair Outcomes Due to Pre-loaded Data
- Transparency and Accountability
- Security Concerns
- Autonomy and Controls
- Impact on Employment
- Use of AI in Warfare
- Moral Agency and Responsibility

Artificial Intelligence and Challenges to Human Society

Artificial Intelligence represents one of the most consequential technological developments of contemporary society.

Its expanding presence in education, employment, communication, healthcare, administration, entertainment, and everyday decision-making has undoubtedly increased human efficiency and created new possibilities for social and economic development.

However, the growing scale of AI use also raises an important sociological question:

- **When does technological assistance become technological dependency?**
- **When does dependency begin to weaken the cognitive, psychological, and social capacities of human beings?**

The answer requires moving beyond the simple opposition between "AI as beneficial" and "AI as harmful" and examining the changing relationship between human agency and technological systems.

The concept of **cognitive offloading** provides an important framework for understanding this problem. Human beings have always used external tools to assist memory, calculation, and problem-solving.

This issue can also be understood through the sociological concept of **human agency**. Agency refers to the capacity of individuals to think, choose, act, and take responsibility for their actions. Excessive technological dependence may gradually shift certain decisions from human judgement to algorithmic recommendations.

When individuals begin to ask an AI system what to think, what to write, what to choose, how to respond, and even how to manage interpersonal situations, technology may cease to function merely as an instrument and begin to influence patterns of human behavior. In this sense, excessive AI dependence may create a tension between technological efficiency and human autonomy.

Family, school, peer groups, community, and other social institutions teach individuals how to communicate, cooperate, negotiate, empathize, resolve conflicts, and participate in collective life. These abilities cannot be developed exclusively through technological interaction

The concept of **alienation** is also relevant to understanding this transformation. In classical sociological thought, alienation refers broadly to a condition in which individuals become separated from meaningful aspects of their own activity and social existence.

This distinction is reflected in the human-centered approach advocated by UNESCO. Its guidance on generative AI in education emphasizes human agency and argues that AI should empower teachers, learners, and researchers rather than displace human intelligence and educational judgement. Similarly, the WHO has emphasized that AI systems should be governed through principles of ethics, accountability, human rights, and appropriate human oversight.

Concept	Thinker / Research tradition	Relevance to AI dependency
Cognitive Offloading	Cognitive psychology / distributed cognition	Delegating memory, reasoning, and problem-solving to AI
Human Agency	Anthony Giddens / structuration theory	Whether humans retain independent decision-making capacity
Alienation	Karl Marx; later sociological interpretations	Separation from one's own intellectual/creative activity
Socialization	George H. Mead, Charles H. Cooley, Émile Durkheim	Development of social and interpersonal capacities
Technological Determinism	Thorstein Veblen	Technology's potential influence on social structures and behavior
Social Cohesion	Emile Durkheim	Effects of weakened interaction, solidarity, and collective relationships
Automation Bias	Human–automation interaction research	Tendency to over-rely on automated recommendations
Digital/AI Literacy	Contemporary AI-education research	Developing the ability to use AI critically rather than dependently

Methods & Techniques of Artificial Intelligence

Machine Learning

Machine learning refers to a part of artificial intelligence that trains computers to learn from data and get better without explicit rules. Developers don't write step-by-step instructions, but feed data into algorithms, from which the system builds predictive models on its own.

Natural Language Processing

Natural Language Processing (NLP) is a branch of artificial intelligence that allows computers to read, write, and understand human language. It bridges the gap between human communication and machine code by combining computational linguistics with deep learning.

Automation & Robotics

Automation and Robotics are a systematic venture of physical machines and intelligent software. Automation allows systems to operate without human intervention & the physical machine is built by robots.

Knowledge-Based Systems (KBS)

A knowledge-based system is an artificial intelligence program that resolves complicated problems within a specialized field by reasoning through a structured collection of human facts, rules, and information.

Neural Networks

A neural network is a computer-based system inspired by the human brain. It uses layers of connected artificial neurons to process data, recognize patterns, and make decisions.

Maintaining Ethics and Integrity In Artificial Intelligence

Ethics in Artificial Intelligence means using artificial intelligence according to principles of fairness, safety, privacy, human rights, and social responsibility. Integrity in Artificial Intelligence means applying these principles honestly and consistently, including checking Artificial Intelligence outputs and accepting responsibility for decisions.

Key Principles of Ethics

Fairness

Artificial Intelligence should not discriminate against people because of gender, religion, caste, race, disability, or economic status.

Privacy

Personal information should be collected with permission, stored securely, and used only for legitimate purposes.

Transparency

People should know when artificial intelligence is being used and, where possible, understand how it reaches important decisions.

Accountability

Developers, companies, and users must remain responsible for artificial intelligence effects; responsibility should not be shifted entirely to the machine.

Human oversight

Humans should review important artificial intelligence decisions, especially in healthcare, education, employment, policing, and finance.

Safety and reliability

Artificial intelligence should be tested, monitored, protected from misuse, and corrected when it makes errors.

Integrity and honesty

Users should verify artificial intelligence-generated information, identify

AI assistance when appropriate, avoid plagiarism, and never knowingly use artificial intelligence to deceive.

Accessibility and inclusion

The benefits of artificial intelligence should be available to different communities, including people with disabilities and those with limited digital access.

Environmental responsibility

Artificial intelligence development should consider energy use, electronic waste, and effects on the environment. UNESCO identifies human dignity, transparency, fairness, environmental sustainability, and human oversight as central to ethical artificial intelligence.

Ethics in Artificial Intelligence

Bias

Artificial intelligence may produce unfair results if its training data reflects existing discrimination.

Misinformation

Artificial intelligence can generate false news, fake images, and misleading content.

Privacy loss

Artificial intelligence systems may analyze personal data without meaningful consent.

Job displacement

Automation can replace some tasks and require workers to learn new skills.

Lack of explanation

Some artificial intelligence systems are difficult to understand, making errors hard to challenge.

Misuse

Artificial intelligence can be used for cyberattacks, fraud, surveillance, or impersonation.

Overdependence

People may trust artificial intelligence without checking whether its answers are accurate.

Integrity in Artificial Intelligence

Integrity in AI means making sure artificial intelligence systems are honest, reliable, accurate, and ethical. It covers the whole life of an artificial intelligence model, from the data used to train it to the final choices it makes. When an artificial intelligence has integrity, people can trust its outputs.

Conclusion

The massive and unregulated use of Artificial Intelligence (AI) has emerged as a significant transformation in human society, influencing not only the economic and technological spheres but also the neurological, mental, psychological, and social dimensions of human life. Although AI offers remarkable benefits in terms of efficiency, accessibility, communication, education, healthcare, and decision-making, excessive dependence on AI may gradually weaken the very human abilities that constitute the foundation of individual and collective social development.

At the neurological level, continuous dependence on AI-assisted solutions may reduce opportunities for individuals to exercise cognitive abilities such as critical thinking, problem-solving, memory, concentration, and decision-making. When answers, ideas, interpretations, and solutions are consistently obtained from intelligent systems, individuals may become less inclined to make sustained cognitive efforts themselves. In the long term, such a pattern may encourage intellectual passivity and reduce the development of independent cognitive skills, particularly among children and young people whose neurological and intellectual capacities are still developing. Thus, technology that is designed to augment human intelligence can, when excessively relied upon, create a paradox in which human cognitive effort is gradually replaced by technological convenience.

Society sustains through communication, cooperation, empathy, trust, mutual responsibility, and meaningful interpersonal relationships. If technological interaction increasingly replaces face-to-face communication and social participation, the quality and depth of human relationships may be affected. Individuals may communicate more frequently through technological platforms while simultaneously experiencing reduced emotional and social connectedness.

Excessive dependence on AI-mediated interaction can also weaken interpersonal skills such as listening, negotiation, empathy, conflict resolution, and understanding non-verbal expressions.

Bill Gates, in his major essay published in Gates Notes on 26 Aug 2026, *"warns that the rapid transition to artificial intelligence will cause massive economic and social turbulence unless society prepares immediately"*

AI dependency can also disturb important **social functions**. Institutions such as family, education, workplace organizations, and community traditionally perform functions that involve human judgement, emotional understanding, socialization, cultural transmission, and collective responsibility. If these functions become excessively automated, there is a possibility of reducing human participation in processes that are fundamentally social rather than merely technical.

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From a sociological perspective, the problem can be understood as a tension between "technological convenience and human autonomy."

Therefore, Artificial Intelligence should be understood neither as an enemy of humanity nor as an unquestionable solution to human problems. It is a powerful social technology whose consequences depend upon the patterns of use, institutional regulation, and cultural values surrounding it.

The fundamental principle should be that AI must augment human intelligence without displacing human agency; facilitate social interaction without replacing human relationships, and support human development without becoming a substitute for it.

Wise Use of Artificial Intelligence

- Check important answers against reliable sources.
- Do not enter confidential, personal, or sensitive data into unknown Artificial Intelligence tools.
- Tell others when content has been significantly created or modified by Artificial Intelligence.
- Review Artificial Intelligence decisions for bias and unfair treatment.
- Keep a human responsible for high-impact decisions.
- Maintain records of data, system changes, testing, and decisions.
- Provide a way for people to question or appeal an Artificial Intelligence decision.
- Use Artificial Intelligence to assist human judgment, not to remove human responsibility.

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