# HUMAN INTELLIGENCE IN THE AGE OF AI: CHALLENGES AND OPPORTUNITIES

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## Abstract

**Purpose:** This paper examines the relationship between Artificial Intelligence (AI) and human intelligence, and discusses the opportunities and challenges that arise as AI is adopted more widely in education, healthcare, business and public services.

**Methodology:** The study is based on secondary research. It reviews books, journal articles, academic papers and reliable websites, groups the findings under three themes (the impact of AI on society, the value of human intelligence, and the future of human–AI interaction), and compares the views of different authors. No primary data were collected.

**Findings:** AI excels at data-intensive and repetitive tasks, while human intelligence contributes creativity, empathy, ethical judgement and adaptability. The main challenges are the effect of automation on employment, data privacy and security, algorithmic bias, and weak transparency and accountability. The literature supports treating AI as a complement to human intelligence rather than a substitute for it.

**Limitations:** The study is a narrative review based on a limited number of sources, does not follow a formal systematic-review protocol and does not test its conclusions empirically. Because AI is developing quickly, some points may change as new evidence appears.

**Practical implications:** The study offers guidance to educators, policymakers and organisations on reskilling and lifelong learning, governance and regulation, human oversight of AI in sensitive decisions, and equitable access to AI.

**Originality/Value:** The paper synthesises the literature around the complementarity of AI and human intelligence and presents a comparison of the two across ten aspects.

**Keywords:** AI, Human Intelligence, Creativity, Automation, Ethics, Human–AI Collaboration

## 1. Introduction

AI is one of the most important technological developments of the twenty-first century. It is no longer confined to research laboratories and has become part of daily life: people use it when they talk to virtual assistants, receive online shopping recommendations and navigate with maps. Its influence extends across many industries. In education, AI supports personalised learning and helps teachers with assessment and instruction. In healthcare, it assists doctors with diagnosis, monitoring and treatment planning. In business, companies use AI to analyse customer behaviour, forecast market trends and improve supply chain management, financial institutions use it to detect fraud and assess credit risk, and manufacturers use it to improve production quality and reduce costs (Ali, 2023; Brynjolfsson & McAfee, 2017).

Despite these benefits, human intelligence remains significant. Human intelligence is more than information processing and decision-making. It includes creativity, the ability to understand how others feel, moral reasoning and the capacity to make choices when a situation is unclear. Throughout history, people have used these capacities to make discoveries, create new technologies and improve society. AI systems can now generate text, images, music and code, but they work with rules, data and statistical patterns; they do not have feelings, lived experience or imagination (Zohuri & Rahmani, 2020).

AI is also changing the nature of work. Tasks once done by people are increasingly handled by machines, although technology also creates new jobs that require new skills. AI systems raise further concerns about the privacy and security of the large volumes of data they depend on, about bias when training data are incomplete or unrepresentative, and about the difficulty of understanding how complex systems reach their decisions. These concerns make it important for institutions to set ethical guidelines and for schools to prepare students not only with technical skills but also with communication, teamwork, critical thinking, creative problem-solving, emotional intelligence and ethical reasoning.

The prevailing view among researchers is that AI should enhance human intelligence rather than substitute for it (Bhange et al., 2025; Thomas, 2025). AI is strong at data processing, pattern recognition and repetitive work, whereas humans contribute empathy, intuition, creativity and social understanding. This paper therefore examines AI and human intelligence together and argues for a synthesis of their strengths rather than a contest between them. The remainder of the paper sets out the objectives and methodology (Sections 2 and 3), reviews

the literature (Section 4), identifies research gaps (Section 5), presents the analysis and a comparison of AI and human intelligence (Sections 6 and 7), and ends with recommendations and conclusions (Sections 8 and 9).

## 2. Objectives of the Study

The objectives of the study are:

- To understand why human intelligence remains important as AI is used more widely.
- To examine the benefits of AI in different areas of life.
- To identify the challenges that arise from the use of AI.
- To explore how humans and AI can work together.
- To highlight the importance of using AI ethically and responsibly.

## 3. Methodology

The study is based on secondary research. It does not collect primary data through surveys or experiments; instead it reviews and synthesises what other authors have written about AI and its relationship with human intelligence. This approach draws on a wide range of sources and perspectives, and it helps to explain current developments and likely future trends.

The material was drawn from books, journal articles, academic and working papers, and reliable websites that provide up-to-date information on AI, including work on current trends and on the origins and progress of the field. The applications of AI in education, healthcare and industry were identified, together with the issues they raise. The findings were grouped under three themes: the impact of AI on society, the value of human intelligence, and the future of human–AI interaction. Particular attention was paid to decision-making and work, and to the problems of job automation, security and privacy. The views of different authors were then compared and contrasted.

The study has limitations. It is a narrative review based on a limited number of sources, it does not follow a formal systematic-review protocol, and it does not test its conclusions empirically. Because AI is developing quickly, some of the points discussed may change as new evidence appears.

## 4. Literature Review

### *4.1 AI across sectors*

The literature shows that AI has altered how people interact, work and gather information. In organisations, AI-driven applications support data analysis, the identification of emerging patterns, customer experience, logistics optimisation and operational efficiency, and they help firms make more effective decisions in a fast-changing and competitive environment (Ali, 2023). Brynjolfsson and McAfee (2017) similarly describe how AI improves business operations through greater efficiency, task automation and innovation. In education, AI tools enable customised learning, virtual learning environments, automated assessment and intelligent teaching assistants. In medicine, they help practitioners to diagnose illness, monitor patients, interpret images and plan care. These gains also require people to upgrade their skills continually, which makes lifelong learning a prerequisite for adapting to a digitally enabled workplace (Brynjolfsson & McAfee, 2017).

### *4.2 Human intelligence and creativity*

Researchers distinguish human intelligence from AI by pointing to qualities that go beyond calculation and data analysis. These include empathy, ethical intuition, creativity, emotional intelligence, contextual understanding and social awareness (Bhange et al., 2025; Zohuri & Rahmani, 2020). Because machines are driven by rules and data, whereas people have emotions and experiences, some aspects of human intelligence, particularly moral discernment and awareness of context in ambiguous situations, may never be fully replicated. This matters in fields such as law, education, healthcare, public administration and leadership.

Creativity has drawn particular attention. AI can produce literature, images, sound and code, but it does so by analysing and imitating patterns in large datasets rather than by drawing on lived experience, emotion or imagination. True originality involves novelty, inquiry, intuitive insight and the ability to go beyond established knowledge, qualities that have driven discovery, technology, art and social progress. AI can support creative work, but it cannot replace human inventiveness (Zohuri & Rahmani, 2020; Thomas, 2025).

### *4.3 Automation and the future of work*

The effect of automation on employment has been widely discussed. Automating routine and time-consuming tasks raises productivity and output, but it also reshapes labour markets. Frey and Osborne (2017) estimated that a substantial share of occupations is susceptible to

computerisation, and many occupations are changing as more capable AI systems begin to automate higher-order functions. Automation is more likely to redefine existing jobs than to replace workers entirely: it takes over repetitive, rule-based and low-cognitive activities and leaves people to concentrate on complex, interpersonal and creative work. Governments, educational institutions and private organisations will need to invest in reskilling, and organisations must prepare employees with the skills that an AI-driven workplace requires (Brynjolfsson & McAfee, 2017).

### *4.4 Ethics, bias, privacy and accountability*

As AI systems are used to make choices about health, education, finance, employment and law, many people worry about fairness, reliability, transparency and the protection of personal information. AI systems trained on biased data can make poor decisions and treat people unfairly. Obermeyer et al. (2019), for example, found that an algorithm used to manage the health of large patient populations in the United States produced racially biased risk scores because it used healthcare costs as a proxy for health needs. Muppala (2025) argues that AI-based systems must be transparent, clear and accountable, with continuous human oversight, and the study stresses fairness and responsible decision-making in sectors that depend on AI. Floridi et al. (2018) likewise propose an ethical framework for a good AI society built on principles such as beneficence, justice and explicability.

The large-scale collection of data by AI systems raises further security, privacy and data-protection problems. Guidelines and legal safeguards are needed to protect citizens' rights and maintain public trust.

### *4.5 Human–AI collaboration*

There is growing discussion of humans and AI working together. AI is very effective at sifting through large quantities of data, spotting patterns and performing repetitive work, while humans excel at emotional intelligence, ethics, communication and creativity. Rane et al. (2024) conclude that combining AI technologies with human expertise leads to better organisational performance, innovation and sustainable development, provided that ethical and responsible practices are maintained. Bhange et al. (2025) compare the strengths and weaknesses of AI and human intelligence and suggest that humans and machines can work together instead of against one another. Thomas (2025) similarly presents AI as an instrument that facilitates and enhances decision-making and business functions, not a substitute for human thought, innovation, morality and experience.

### *4.6 Summary*

Overall, the literature suggests that AI is transforming how people engage with each other and the world, offering new possibilities and creating complex challenges. Researchers broadly agree that human intelligence remains important because of qualities such as imagination and the capacity to understand emotions, and that this calls for collaboration between people and AI.

## 5. Research Gaps

Although the benefits and risks of AI have been widely discussed, much remains to be understood about how humans and AI can best work together. Further research is needed on the following questions:

- How can human creativity, emotional engagement and judgement be preserved and strengthened when people work alongside AI?
- What will be the long-term effects of automation on employment, and how can job security be protected?
- How can personal data be kept safe and used responsibly in AI systems?
- Which skills do workers and students need to work effectively with AI, and how should education systems develop them?
- How can the benefits of AI be shared widely rather than concentrated among a few groups?
- What ethical and regulatory frameworks are needed to ensure that AI is fair and beneficial to society?

## 6. Analysis and Findings

The literature was analysed thematically to understand the relationship between AI and human intelligence. Three sets of findings emerge.

### *6.1 Opportunities*

AI is used in many areas and has improved efficiency and productivity. It has created opportunities in education, healthcare and business by improving learning experiences, healthcare services and customer service. Human intelligence nevertheless remains necessary for tasks that require creativity, empathy and critical thinking.

### *6.2 Challenges*

The first challenge is the effect of automation on the job market. Automation increases efficiency, but it has also redefined roles and raised the demand for advanced digital and analytical skills, which calls for workforce reskilling and training. The second is data protection and privacy: AI systems typically draw their value from large volumes of personal and organisational data, so safeguarding that data is essential for public trust. The third is bias and accountability. If AI algorithms are built on insufficient or unrepresentative datasets, they can produce biased outcomes in hiring, medicine, education, finance and criminal justice (Obermeyer et al., 2019). Many AI systems also work like a black box whose reasoning is hard to understand, which raises questions of fairness, responsibility and accountability. The findings therefore point to the need for transparent AI systems that allow oversight and for an ethical approach that ensures fair operation (Muppala, 2025; Floridi et al., 2018).

### *6.3 Complementarity*

AI and human intelligence have strengths that complement each other. AI provides speed, accuracy and the ability to handle large volumes of data, while human intelligence provides creativity, empathy, ethical reasoning and adaptability. The most sensible approach is therefore not to replace human skills with AI but to use the speed and accuracy of AI together with empathy, ethics, creativity and critical thinking. Such a balanced approach supports development, responsible innovation and long-term social well-being (Rane et al., 2024; Bhange et al., 2025).

## 7. Comparison of AI Capabilities and Human Intelligence

Table 1 summarises the main differences between AI and human intelligence discussed in the literature reviewed above.

**Table 1: Comparison of AI and human intelligence**

| Aspect | Artificial intelligence (AI) | Human intelligence |
|---|---|---|
| **Data processing** | Processes large amounts of data quickly and accurately. | Understands and selects information according to needs and goals. |
| **Decision-making** | Decides on the basis of programmed data and patterns. | Uses experience, judgement and common sense. |

| | | |
|---|---|---|
| **Creativity** | Generates outputs from existing data but has limited originality. | Creates new ideas and thinks in innovative ways. |
| **Emotions** | Cannot understand or express real emotions. | Understands feelings and shows empathy towards others. |
| **Ethics** | Cannot judge right and wrong on its own. | Decides on the basis of values, ethics and responsibility. |
| **Adaptability** | Performs well in familiar situations but struggles with unexpected change. | Adapts readily to new situations and changing environments. |
| **Problem-solving** | Solves problems using algorithms and available data. | Uses critical thinking, intuition and experience. |
| **Efficiency** | Completes repetitive tasks quickly and accurately. | May take longer but considers context and consequences. |
| **Learning** | Learns from training data and programmed models. | Learns from experience, observation and real-life situations. |
| **Future role** | Acts as a tool that supports human work and productivity. | Guides, controls and uses AI for the benefit of society. |

Source: Author's synthesis based on the literature reviewed (Bhange et al., 2025; Thomas, 2025; Zohuri & Rahmani, 2020).

## 8. Implications and Recommendations

*Education and lifelong learning.* As AI changes work and daily life, people will need to update their skills and knowledge throughout their careers. Schools and universities should equip students with technological skills and also with communication, teamwork, critical thinking, creative problem-solving, emotional intelligence and ethical reasoning, which will matter more as AI takes over routine tasks. Governments and companies should support reskilling programmes (Brynjolfsson & McAfee, 2017).

*Governance and regulation.* Governments, industries, research institutions, universities and policymakers should work together to set standards, ensure transparency and regulate AI so that it serves society (Floridi et al., 2018). Strong cybersecurity, clear transparency policies and a robust legal framework are needed to protect personal data while still supporting innovation.

*Human oversight and fairness.* AI systems used in sensitive areas such as hiring, health, finance and justice should be tested for bias, and human decision-makers should remain responsible for important decisions (Muppala, 2025; Obermeyer et al., 2019).

*Equitable access.* Everyone should be able to understand and have fair access to advances in AI, so that its benefits contribute to a more equitable and sustainable world.

*Investment in research.* Governments and institutions should invest in research and development so that AI is directed towards social benefit, and should pursue the research gaps identified in Section 5.

## 9. Conclusion

AI has become one of the most influential technologies of the modern era, transforming how people live, work, learn and make decisions. It has improved efficiency and productivity across education, healthcare, business, finance and communication, and it has supported innovation and economic development. The findings of this study show that, despite these advantages, AI cannot substitute for the distinctive qualities of human intelligence: imagination, emotional insight, compassion, intuition and ethical judgement. Whereas AI relies on data and algorithms, humans can weigh values, social context and ethical responsibilities to reach sound judgements, which remains critical in education, healthcare, leadership and policy-making.

The widespread adoption of AI also raises serious concerns about job losses, data privacy and security, algorithmic bias, accountability and transparency. Automation changes the skills that jobs require, which makes lifelong learning and continuous reskilling essential. AI systems must be designed to protect privacy and data security if public trust is to be maintained, and governments, universities, companies, researchers and policymakers must work together to set regulations and ethical norms.

The future is not one of AI against humans. AI handles large volumes of information, pattern recognition and repetitive tasks, while humans contribute creativity, reasoning, ethics, empathy, communication and flexibility. When the two are combined, decision-making gains both the efficiency of the machine and the judgement of the person. AI is, and should remain, a complementary and assistive technology rather than a substitute for human intelligence. Embracing it in a way that complements humanity requires continuous emphasis on learning,

ethical innovation, sound policy and human-centred AI, and it points towards a sustainable and progressive future for present and coming generations.

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