

# Position Paper on Artificial Intelligence & Blockchain

In today's rapidly evolving technological landscape, we have unprecedented opportunities to address longstanding societal challenges that have persisted for decades. With the right approach, technology can empower us to overcome obstacles that previously seemed impossible, opening up a new era of progress and positive change. However, technology is just a tool and it is up to us to define how it is used.

We are more aware than ever of issues like privacy breaches, the misuse of personal information, and the spread of fake news and 'deep fakes', which may seem innocuous when face swapping celebrities and augmenting their voices but can produce malicious outcomes that undermine social cohesion while extracting a financial cost. In the past, basic software and advanced data analysis were separate, but now they have come together under the broad term «AI» summarising the catch all for artificial intelligence.

On one hand, the crux of AI lies in its ability to extract granular insights from data to make informed decisions. Generative AI<sup>1</sup> products offer benefits but raise questions about data reliability and ownership. On the other hand, Blockchain, with its decentralised and secure nature, could mitigate these challenges. However, blockchain adoption faces its own set of challenges like scalability and regulatory complexities. What can be done to overcome the challenges these two technologies generate on their own? Privacy concerns posed by AI could be efficiently mitigated through blockchain's properties including its robust encryption, data verification and decentralised storage. These features may enhance privacy in AI systems by verifying and managing consent, providing clear notifications of personal data usage and minimising data sharing between controllers and processors. AI in turn could enhance blockchain scalability and security by dynamically optimising consensus mechanisms, identifying and mitigating vulnerabilities through advanced threat detection and facilitating predictive analytics to preemptively address potential network bottlenecks and cyber threats.

The convergence of these technologies could lead to significant transformations, guiding humanity towards a future that embraces sustainability and social consciousness. Yet, this same potential harbors the risk of intensifying existing systemic problems. In essence, technology serves as a double-edged sword, capable of fostering progress or deepening divides which underscores the urgent need for regulatory frameworks centered around human welfare and collaborative international standards.

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1. This report discusses the implications of generative artificial intelligence, consisting in particular of various machine learning and deep learning techniques to elicit a variety of use cases, and how the intersection of these sophisticated models may interact with blockchain technology. Rather than focusing on the 'catch all' buzzword of AI.

Without a unified approach, the possibility of a divided future looms, where isolated efforts block innovation and the capacity of technology to address or amplify global challenges remains a precarious uncertainty. Understanding the realistic implications of technology, including its challenges, strengthens the case for collective action. It paves the way for a future where technology truly serves the greater good, bridging divides and catalyzing solutions for our most pressing global issues.

## **AI Challenges in Real World Applications**

One of the central challenges when it comes to AI is the acquisition of high-quality (un-biased) data in significant quantities for AI models, particularly emphasising the need for generalisability across diverse real-world scenarios. Consider the healthcare sector, where AI algorithms require access to extensive and varied datasets to develop robust diagnostic tools capable of identifying rare diseases or predicting patient outcomes with a high degree of accuracy. Another key challenge is the opacity of decision-making processes in many AI systems – commonly referred to as the «black box» dilemma. Here, ethical and trust related concerns include difficulties in understanding how AI systems arrive at their decisions, hindering users from comprehensively evaluating their reliability and potential biases. This lack of transparency may impede regulatory compliance and hinder efforts to ensure fairness and equity in AI-driven processes, exacerbating issues of algorithmic discrimination and opacity in automated decision-making systems. The black box nature of AI can hinder efforts to diagnose and rectify errors and biases, limiting opportunities for continuous improvement and reinforcing the notion of AI systems and inscrutable or unpredictable entities.

Addressing this challenge requires prioritising the explainability of AI models to ensure transparency and accountability in decision-making. In the financial sector, AI-powered credit scoring models may impact individuals' access to financial services without providing clear explanations for the decisions made, leading to questions of fairness and the need for greater transparency in algorithmic decision-making processes. Moreover, the substantial computational demands of advanced AI models present financial and environmental considerations that pose challenges for widespread adoption and sustainability. The development of autonomous vehicles requires AI algorithms to demand significant computational resources for real-time decision-making – prompting discussions around energy consumption and environmental implications. Additionally, the rapid pace of AI advancements outpacing regulatory measures results in gaps in oversight and policy, creating challenges in ensuring responsible and ethical AI deployment which can be seen playing out in real time in the global debate around AI-powered facial recognition systems in public spaces.

## Overview of AI and Blockchain Convergence

AI and blockchain are leading the charge towards innovation, each bringing unique benefits to the table. By integrating these technologies, not only are their individual strengths amplified, but a dynamic synergy is created, enabling AI to thrive with enhanced trust, transparency and efficiency, while blockchain systems benefit from optimised operations and increased security measures. Additionally, the decentralized nature of blockchain can democratise the governance of AI, preventing the concentration of power and control within a handful of large entities. By distributing the decision-making process across a blockchain network, various stakeholders can have a say in how AI systems are trained, developed and used, enabling ethical governance. Conversely, AI mechanisms may be deployed to check-detect smart contract vulnerabilities or detect anomalies and threats within a blockchain network.

In practical terms, the application of AI and blockchain convergence is already taking shape in the realm of decentralised finance (DeFi), where AI algorithms are leveraged to optimise liquidity provision. By enhancing automated market-making processes through AI, trading efficiency is improved and users can access optimal trading opportunities in a dynamic market environment.

Blockchain technology also plays a crucial role in enabling transparent asset management in industries such as manufacturing. For instance, creating digital replicas of industrial machinery linked to blockchain records allows for predictive maintenance and streamlined asset tracking, enhancing operational efficiency and maintenance practices.

In the context of the Metaverse, AI and blockchain technologies are reshaping entertainment and communication landscapes. AI personalises the content, while blockchain ensures that users truly own their digital assets, creating a rich, interactive world that is secure and full of possibilities. In the evolving industrial metaverse, the synergy between AI and blockchain technologies facilitates federated learning approaches within enterprise networks, allowing for collaborative creation of products and services through the utilisation of digital twins.

Furthermore, in supply chain sustainability, blockchain solutions play a vital role in ensuring authenticity and ethical sourcing practices, by establishing a reliable audit trail. AI contributes significantly by analysing data to optimise supply chains, predict trends, and ensure materials meet sustainability criteria. For instance, tracking the journey of sustainable materials in industries like fashion through blockchain-enabled traceability mechanisms, combined with AI's predictive analytics, promotes transparency and accountability, supporting sustainable practices and consumer trust. In community-based projects, while blockchain encourages decentralised decision-making and participation from diverse stakeholders, AI can streamline project selection, monitor progress, and facilitate more effective engagement through data analysis and automated processes. Together, AI and blockchain are paving the way for a more sustainable, inclusive, and transparent approach to industry and community initiatives.

In the healthcare space, applications can leverage the combined power of AI and blockchain for secure data sharing, patient privacy protection, and efficient medical record management. Furthermore, collaborative innovation is fostered by AI and blockchain technologies through enhanced data analysis, secure and transparent record-keeping, and incentivised data sharing models. AI algorithms can predict health trends, analyse patient data for better diagnostics and treatment plans, while blockchain ensures the integrity and confidentiality of these data exchanges. This synergy enables stakeholders to collaborate on a global scale, sharing medical insights without compromising patient confidentiality. Blockchain's immutable ledger and AI's analytical capabilities can work together to streamline clinical trials, research, and patient care - ensuring that medical advancements are both groundbreaking and ethically sound.

## Conclusion and ESG Considerations

The world is becoming increasingly complex, with widening inequality, oftentimes exacerbated through the pace of digitalisation, including where, how and for whose benefit frontier technologies are applied. There is a need to establish transparent and ethical frameworks that prioritise fairness, accountability, and societal well-being. The interplay between governance<sup>2</sup> principles and technological advancements when discussing blockchain and AI convergence necessitate global collaboration and ethical standards to ensure a cohesive approach to their integration. By advocating for transparency, fairness, collaboration and a human-centric approach, stakeholders can navigate the complexities of AI and blockchain convergence while mitigating potential ethical risks and promoting a more sustainable and equitable technological landscape. It is also important to consider economic and ethical implications in tandem, recognising the interconnected nature of social, economic and ethical factors in shaping the impact of AI and blockchain technologies on society. Accountability mechanisms are needed to address unintended consequences and ensure responsible behavior in the development and deployment of AI systems integrated with blockchain technology (preventing perverse instantiation and the 'paperclip problem').

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<sup>2</sup> AI Governance Functions defined and articulated in the Interim Report of the High-Level Advisory Body of the UN Secretary-General, [www.un.org/sites/un2.un.org/files/un\\_ai\\_advisory\\_body\\_governing\\_ai\\_for\\_humanity\\_interim\\_report.pdf](http://www.un.org/sites/un2.un.org/files/un_ai_advisory_body_governing_ai_for_humanity_interim_report.pdf)

## Signatories of the Position Paper



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