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The Impact of Artificial Intelligence on Criminal Liability: Legal Challenges, Legislative Gaps, And Regulatory Perspectives in The European Union

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Abstract

The rapid development and widespread integration of artificial intelligence (AI) into contemporary society have generated significant challenges for criminal law, particularly regarding the attribution of criminal liability, the identification of responsible actors, and the adequacy of existing legal frameworks. This study aims to examine the legal implications of AI-assisted criminal conduct, focusing on legislative gaps, doctrinal controversies, and emerging regulatory perspectives within the European Union.

The research adopts a qualitative methodology based on a narrative literature review and doctrinal legal analysis of relevant academic publications, European legislative instruments, and international regulatory frameworks. Particular attention is given to Regulation (EU) 2024/1689 (AI Act), the principles of criminal responsibility, and the legal challenges associated with autonomous and semi-autonomous AI systems.

The analysis explores three interconnected dimensions: the attribution of criminal liability in AI-related offences, the limitations of traditional concepts of intent, negligence, and causation, and the relationship between technological autonomy and human accountability. The reviewed literature highlights substantial difficulties in establishing responsibility when AI systems contribute to harmful or criminal outcomes through complex, unpredictable, or insufficiently transparent decision-making processes. Furthermore, the study identifies regulatory fragmentation, evidentiary challenges, and the absence of harmonized EU rules specifically addressing criminal liability for AI-generated harm.

The findings suggest that existing criminal law principles remain essential but may require doctrinal clarification and targeted legislative adaptation. Although the AI Act establishes important regulatory obligations, it does not create a comprehensive framework governing criminal liability.

The study concludes by emphasizing the importance of human oversight, algorithmic transparency, accountability mechanisms, and proportionate legal safeguards. It contributes to ongoing academic debates by proposing directions for future legal research and regulatory development aimed at ensuring legal certainty, fundamental rights protection, and effective criminal accountability in the European Union.

Keywords: Artificial Intelligence, Criminal Liability, European Union Law, AI Act, Legal Accountability, Legislative Gaps, Qualitative Literature Review