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The Dilemmas and Solutions in the Application of Criminal Law to Property Crimes in the Age of Artificial Intelligence

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Abstract

With the rapid development of Artificial Intelligence (AI) technology, the forms and methods of property crimes have undergone significant changes. AI has not only enhanced the capabilities of criminals but also increased the concealment and complexity of criminal activities. These changes pose new challenges to the existing criminal law system. This paper explores the main characteristics of property crimes in the AI era, analyzes the dilemmas encountered in the application of criminal law, including legal lag, difficulties in evidence collection, and technological barriers. In response to these dilemmas, the paper proposes corresponding countermeasures, including improving the legal system, innovating legislation, enhancing technical support, and promoting international cooperation. By analyzing these issues and solutions, this paper aims to provide useful references and suggestions for the application of criminal law to property crimes in the age of AI.

Keywords

Artificial Intelligence, Property Crimes, Criminal Law Application, Legal Dilemmas, Solutions

1. Introduction

In today's rapidly advancing information technology landscape, Artificial Intelligence (AI) is profoundly transforming various aspects of society. Especially in the realm of criminal law, the application of AI presents unprecedented challenges and opportunities for traditional legal systems. Property crimes, which involve illegal methods to seize others' assets, have become increasingly complex with advancements in AI technology. AI has not only improved the technical capabilities of criminals, enabling them to carry out more efficient and covert criminal activities but also introduced new demands on the existing criminal law application. Currently, the existing criminal law exhibits clear lag and difficulty in addressing new forms of property crimes driven by AI, with issues such as outdated legal provisions, challenges in evidence collection, and technological barriers. Therefore, this

study aims to explore the dilemmas of applying criminal law to property crimes in the AI era and propose possible solutions to provide theoretical support and policy recommendations for relevant legal reforms and practices. This paper will first introduce AI technology and its applications in property crimes, then analyze the main dilemmas in the application of criminal law, and based on this analysis, propose targeted countermeasures and suggestions to promote the synchronization of criminal law systems and technological advancements (King et al., 2020, pp. 89-120).

2. Overview of Artificial Intelligence Technology

2.1 Basic Concepts of Artificial Intelligence

Artificial Intelligence (AI) refers to the technology that simulates or implements human intelligence behaviors through computer systems. Its core goal is to enable computers to perform tasks that typically require human intelligence, such as perception, reasoning, learning, and decision-making. AI encompasses several subfields, with the most significant ones including Machine Learning, Natural Language Processing, Computer Vision, and Expert Systems. Machine Learning is a key branch of AI that allows computers to identify patterns and make predictions by analyzing large amounts of data without explicit programming. Natural Language Processing enables computers to understand and generate human language, facilitating automated human-computer interactions. Computer Vision allows computers to extract and analyze information from images or videos, enabling image recognition and processing. Expert Systems mimic human expert decision-making processes using rules and knowledge bases to solve specific domain problems. The development of AI technology relies on continuous advancements in big data, algorithms, and computing power. With improvements in computer hardware and breakthroughs in data processing technology, AI is demonstrating increasingly powerful capabilities across various fields. From autonomous vehicles to intelligent customer service, from recommendation systems to medical diagnostics, AI is gradually permeating various industries and daily life, transforming traditional operational methods and decision-making processes (Bokovnya et al., 2020, pp. 1054-1057).

2.2 Application of Artificial Intelligence in Property Crimes

The rapid development of AI technology has not only advanced societal progress but also provided new tools and opportunities for property crimes. In the realm of property crimes, AI applications are evident in several areas, significantly enhancing the concealment, complexity, and severity of criminal activities. Firstly, phishing is a common property crime method where criminals use AI technology to generate highly realistic fake websites or emails to deceive victims into providing personal information or financial account data (Custers, 2022, pp. 205-223). AI's natural language processing capabilities make phishing messages more convincing and deceptive, increasing the difficulty for victims to recognize them. Secondly, automated scams use machine learning technology to analyze large amounts of data, identify potential victims, and execute personalized fraud. For example, AI can analyze social media data to determine victims' interests and habits, enabling the design of more precise scam

strategies. These automated methods greatly enhance the efficiency of fraud, allowing criminals to achieve higher returns in a shorter time. Furthermore, financial fraud has become more complex due to AI technology. Criminals use algorithms to generate false transaction records or account information, faking financial behaviors to conduct illegal transfers or money laundering. The use of AI makes these financial fraud activities more covert, making it challenging for traditional review methods to detect and prevent them. In identity theft, AI technology can quickly obtain and exploit others' personal information through data mining and pattern recognition. The application of deep learning technology further enhances the efficiency of acquiring and using personal information. Finally, malware and cyber attacks continue to evolve. AI enables malware to autonomously learn and adapt to defensive measures, employing more sophisticated attack strategies. Through intelligent attack methods, property criminals can bypass traditional security defenses, causing greater damage. Overall, the application of AI in property crimes not only raises the technical level of criminal activities but also imposes higher demands on legal and regulatory systems. To address these challenges, timely revisions to existing laws and enhanced technical protection measures are urgently needed (Abbott & Alex, 2020, pp. 177-204).

3. Concept and Classification of Property Crimes

3.1 Definition of Property Crimes

Property crimes refer to criminal activities aimed at unlawfully infringing on the property rights of others. The common characteristic of these crimes is that perpetrators use illegal means to directly or indirectly acquire others' property or financial benefits, causing damage to the victims' property rights. Property crimes generally involve illegal possession, destruction, or transfer of property, with the intent of gaining economic benefits through improper means. The definition of property crimes includes the following key elements:

1) Illegality: Property crimes are characterized by their clear illegal nature. Perpetrators violate legal regulations and obtain or transfer property through unlawful methods. Whether through direct theft, fraud, or technological means such as cyber attacks, these actions are classified as illegal by law.

2) Property Damage: Such criminal behavior causes direct or indirect damage to others' property. Property damage includes actual economic losses, such as monetary loss or property damage, as well as potential economic losses, such as business interruptions or loss of commercial opportunities.

3) Intent: The purpose of committing property crimes is to obtain illegal property benefits. Whether for personal gain or on behalf of others, perpetrators aim to achieve economic profit through illegal means.

4) Method: The methods of property crimes are diverse, ranging from direct physical actions like theft and robbery to indirect technological methods like cyber fraud and identity theft. With technological advancements, the methods of property crimes continuously evolve, becoming increasingly complex.

The widespread and complex nature of property crimes requires the legal system to be adaptable and flexible to address the ever-changing forms of crime. Understanding the basic definition of property crimes helps in analyzing their development trends in the AI era and their impact on criminal law (Bagaric et al., 2022, p. 95).

3.2 Main Types of Property Crimes

Property crimes encompass a wide range of activities, from traditional theft to modern cyber crimes. Based on the specific forms and methods of criminal behavior, they can be classified into the following categories: Theft: One of the most common forms of property crime, theft involves unlawfully obtaining others' property. It includes burglary, pickpocketing, and robbery. Theft usually involves direct physical violation of others' property, with perpetrators often breaking into premises, prying open locks, or using other means to illegally acquire property. Fraud: Fraud involves deceiving others through fabricated facts or concealing the truth, causing them to willingly part with their property under false pretenses. Fraudulent methods include telecom fraud, online fraud, investment fraud, etc. The essence of fraud is to mislead victims with false information or promises, leading to erroneous economic decisions and illegal profits. Robbery: Robbery involves using violence or threats to forcibly take others' property. It is characterized by violence and usually occurs in public places, such as street robberies or hijackings. This criminal behavior not only threatens the victim's property but also poses serious risks to personal safety. Financial Crimes: This category includes various illegal financial activities, such as securities fraud, money laundering, and illegal fundraising. These crimes exploit the complexities of financial systems and markets through false transactions and forged financial documents. Financial crimes are often highly concealed and complex, posing threats to financial market stability and economic health. Cyber Crimes: Emerging with the development of internet technology, cyber crimes include hacking attacks, malware distribution, and phishing. Perpetrators use online methods to unlawfully acquire property information, perform illegal transfers, or steal data. The covert and cross-border nature of cyber crimes makes them difficult to address with traditional legal measures. Identity Theft: This involves illegally obtaining personal information of others and using it for fraud or illegal activities. Common methods include forging identification documents and misusing credit card information. Identity theft not only damages personal property but can also have long-term effects on individuals' credit records and life stability. Each type of property crime has its specific behavior patterns and methods of execution. With continuous technological advancements, the forms of crime are constantly evolving. This requires legal and judicial authorities to consider the characteristics of new types of crime when formulating and implementing relevant laws, making timely adjustments and improvements (Blauth, Oskar & Andrej, 2022, pp. 77110-77122).

3.3 Characteristics of Property Crimes

Property crimes exhibit several prominent characteristics that help in identifying and understanding the nature of these crimes. Firstly, the core characteristic of property crimes is economic motivation. Perpetrators obtain others' property or financial benefits through illegal means, seeking unjust

economic gains for individuals or groups. This profit-driven motive makes the illicit acquisition of property the primary aim, with economic incentives often driving criminals to employ various unlawful methods. Secondly, illegality is another key feature of property crimes. These criminal acts clearly violate legal regulations, with perpetrators committing crimes such as theft, fraud, or robbery without legal authorization. This illegality not only infringes on others' property rights but also disrupts societal legal order. With technological advancements, modern property crimes exhibit higher levels of concealment and technical sophistication. Perpetrators use advanced technology for crimes, such as phishing, hacking, and spreading malware, making criminal behavior more covert. The application of technology not only enhances criminals' ability to evade detection but also makes it difficult to identify and stop criminal activities in a timely manner. Complexity is another important characteristic of property crimes. In the context of informationization and globalization, the methods of committing property crimes are becoming increasingly complex. Perpetrators may use multiple methods, such as fake websites, phishing emails, and malware, to achieve their illegal objectives. This complexity increases the difficulty of identifying and combating property crimes, requiring higher capabilities from legal and enforcement agencies. Additionally, property crimes often exhibit persistence and organizational characteristics. Many criminals or criminal groups engage in property crimes over extended periods, establishing specialized criminal networks to carry out their activities. This organization and persistence make it more challenging to combat and prevent property crimes, necessitating a comprehensive approach involving legal, technological, and social resources. Finally, the social harm caused by property crimes is a significant characteristic. Beyond direct financial loss, property crimes can negatively impact social order, economic stability, and public safety. For example, financial fraud not only causes economic losses for victims but may also lead to societal unrest and a crisis of confidence in the financial system. This social harm makes property crimes a pressing social issue that requires attention and resolution. In summary, these characteristics of property crimes reveal their complexity and diversity in modern society, necessitating continuous updates and improvements in legal and enforcement strategies to effectively curb and combat such criminal behaviors.

4. Characteristics of Property Crimes in the AI Era

4.1 Impact of Artificial Intelligence Technology on Property Crimes

In the AI era, technological advancements have profoundly impacted property crimes, altering the methods, tools, and nature of criminal activities. While Artificial Intelligence (AI) technology enhances productivity and drives societal progress, it also provides criminals with new tools and opportunities, leading to several major impacts. Firstly, AI technology has significantly increased the intelligence and automation of criminal methods. Criminals can use AI algorithms for cyber attacks, such as automated phishing attacks and distribution of malicious software. These tools can continually optimize through machine learning, improving success rates and allowing rapid attacks on numerous targets. For example, AI-based phishing emails can automatically generate highly realistic false information,

making it easier for victims to be deceived. Secondly, AI technology has made information collection and analysis more efficient. Criminals can use data mining and machine learning to analyze vast amounts of data, obtaining valuable personal or financial information. Through this method, they can precisely target and strategize. For instance, AI can help criminals identify potential high-value targets and conduct targeted social engineering attacks for illegal gains. Thirdly, the impact of AI deepfake technology on property crimes cannot be overlooked. Deepfake technology can create highly realistic fake videos and audio, which can be used for identity fraud and false advertising. For example, criminals can use deepfake technology to fabricate victims' voices or videos, leading to fraudulent financial transactions or scams, causing significant financial loss. Furthermore, AI technology has enhanced the covert and cross-border nature of criminal activities (Mahardhika, Pudji & Aminuddin, 2023, pp. 1-12). Using encryption and anonymity tools, criminals can conduct cross-border crimes globally, making it difficult to trace and prosecute. AI technology can help criminals conceal their true identity and location, complicating traditional legal measures. For example, fake identities generated by AI can be used for financial fraud in different countries and regions, increasing the difficulty of international law enforcement cooperation. Overall, AI technology impacts property crimes in multiple ways, making criminal methods more advanced and covert while increasing the intelligence and automation levels of criminal activities. These changes require legal and enforcement agencies to continuously update strategies, integrate advanced technology, and strengthen prevention and response efforts against property crimes in the AI era.

4.2 New Forms of Property Crimes in the AI Era

In the AI era, property crimes have exhibited some new forms that reflect the application and impact of AI technology in the criminal field. Firstly, intelligent network fraud has become a prominent new form. Leveraging Natural Language Processing (NLP) and machine learning algorithms, criminals can generate highly realistic fraudulent emails, text messages, or social media messages. These messages are meticulously crafted and can be personalized based on victims' behavior data and preferences, significantly increasing the success rate of fraud. The use of AI technology makes network fraud more covert and precise, making it harder for victims to detect. Secondly, the emergence of deepfake fraud has altered the landscape of property crimes. Deepfake technology can produce highly realistic fake videos and audio, which can be used for identity impersonation and false advertising. For example, criminals can fabricate someone's voice or image to conduct fraudulent financial transactions or scams. Due to the high realism of deepfake content, victims often struggle to discern authenticity, making them more susceptible to fraud. Thirdly, automated financial trading manipulation has emerged as a new form of property crime. AI technology enables criminals to use high-frequency trading and complex algorithms to manipulate market prices within extremely short timeframes. This manipulation can destabilize financial markets and lead to significant economic losses. This automated trading manipulation not only affects market stability but also poses serious economic risks. Additionally, AI-assisted cyber attacks have become more common. Using AI technology, criminals can launch

sophisticated cyber attacks, including ransomware, data breaches, and denial-of-service attacks. AI algorithms can continuously optimize and adapt attack strategies, making them more difficult to detect and defend against. The use of AI in cyber attacks increases the scale and impact of such crimes, posing challenges for traditional cybersecurity measures (Greenstein, 2022, pp. 291-323). Finally, the rise of AI-powered identity theft is a significant concern. AI technology can analyze vast amounts of personal data, creating accurate fake identities or conducting targeted phishing attacks. For instance, criminals can use AI to generate fake personal information that mimics real identities, facilitating fraudulent activities and illegal financial transactions. This advanced identity theft method poses new challenges for identity verification and fraud prevention. In summary, the AI era has given rise to new forms of property crimes, driven by technological advancements and the innovative application of AI. These new forms of crime exhibit higher levels of automation, intelligence, and covert operation, requiring ongoing adaptation and enhancement of legal and enforcement strategies to effectively address and combat these evolving criminal threats.

5. Challenges in the Application of Criminal Law

In the era of artificial intelligence, the application of criminal law faces a series of complex challenges, primarily stemming from technological advancements that challenge the traditional legal system. First, the concealment of criminal activities has significantly increased the difficulty of legal tracking and evidence collection. AI technology enables criminals to hide their true identities and activities through anonymization and encryption techniques. Virtual identities and complex network structures make it challenging for law enforcement agencies to trace and identify criminals, thus affecting the effective application of criminal law. Secondly, the lag in legal applicability is another major challenge. Criminal laws are often lagging behind technological advancements. The rapid progress of AI technology has led to the emergence of many new types of crimes, which existing legal frameworks and provisions often fail to adequately address. For example, legal provisions addressing deepfake technology and automated cyber attacks are still underdeveloped, resulting in a lack of applicable legal standards in actual cases and affecting judicial decisions and rulings. Thirdly, obtaining and verifying evidence has become a significant challenge in the application of criminal law. AI technology makes evidence of criminal activities more complex, and traditional methods of evidence collection may struggle to keep up. For instance, fake audio and video content generated by deepfake technology can be difficult to distinguish from real content, making it challenging to determine the authenticity and reliability of evidence. Additionally, the authenticity of virtual evidence and log data generated by AI may also be questioned, impacting case judgment and handling. Furthermore, the issue of legal applicability in cross-border crimes has become increasingly prominent. The application of AI technology allows criminal activities to easily cross international borders, and traditional legal systems often struggle to effectively address this cross-border nature of property crimes. International laws and cross-border law enforcement cooperation mechanisms have not fully kept pace with technological

developments, leading to numerous obstacles in handling cases involving multiple countries. Finally, the technical adaptability of criminal law and issues of technological ethics are also significant challenges. Criminal law needs to continuously adapt to the challenges posed by emerging technologies while also considering the ethical issues related to technology use. For example, the use of AI technology in law enforcement may involve privacy and data protection issues. Balancing the application of technology with the protection of individual rights while ensuring legal fairness becomes an important challenge in lawmaking and implementation. In summary, the era of artificial intelligence presents unprecedented challenges for the application of criminal law. To address these challenges, legal and enforcement agencies need to continuously update legal frameworks, enhance technological response capabilities, strengthen international cooperation, and find a reasonable balance between technological advancements and individual rights protection. Only through comprehensive measures can effective action be taken against property crimes in the AI era and maintain societal safety and stability.

6. Conclusion

The rapid development of artificial intelligence technology has introduced new challenges to property crimes, altering the methods and characteristics of criminal activities. New forms of crime such as intelligent network fraud, deepfake fraud, and automated financial manipulation not only increase the concealment of criminal behavior but also complicate the application of criminal law. The legal system faces difficulties such as enhanced concealment, lag in applicability, complexity of evidence, and challenges in cross-border cooperation when addressing these new types of crime. To effectively respond to these challenges, legal and enforcement agencies need to continually update legal frameworks, enhance technological response capabilities, and strengthen international cooperation. At the same time, a balance must be found between legal applicability and technological ethics to ensure fairness and effectiveness in the law. Only through comprehensive measures can effective action be taken against property crimes in the AI era, safeguarding societal security and stability.

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