Santander Art and Culture Law Review 2/2023 (9): 117-142
DOI: 10.4467/2450050XSNR.23.025.18645

GENERAL ARTICLES

Vissarion Giannoulis*

vissariong@yahoo.com
orcid.org/0009-0000-5782-4535
Centre of Criminal Law and Criminology
University of Paris Nanterre
UFR DSP, Bât. Simone Veil,
200 Av. de la République
92000 Nanterre, France

Galatea Kapellakou**

kapellakou_galateia@yahoo.com
orcid.org/0000-0003-2561-6859
Department of Computer Engineering & Informatics
University of Patras
N. Kazantzaki, University Campus
26504 Patras, Greece

Blockchain and Illicit Trafficking in Cultural Goods

Abstract: Blockchain could be used as a mechanism to certify the provenance and movements of cultural goods and contribute to the fight against illicit trafficking of cultural property. By strengthening the traceability of cultural goods, blockchain can simplify due diligence requirements and facilitate prosecution and

* **Vissarion Giannoulis** is a Postdoctoral Researcher in the Centre of Criminal Law and Criminology of the University of Paris Nanterre, where he works on a research project on New Technologies and Criminal Procedure. He also teaches Criminal and European Law courses at the same University. He has practiced law in Greece and worked as an expert on European Criminal Law in various legal projects. His areas of interest include Criminal Law, Human Rights Law, European Union Law, Tech Law, and Cultural Heritage Law.

** **Galatea Kapellakou** is Adjunct Lecturer at the University of Patras where she is lecturing on Tech Law. She is also a lawyer since 2004 collaborating with leading law firms and research centers. Galatea possesses wide experience in European and international projects (HORIZON, Twinings, Europeaid, etc.), where she participates as an expert in IP and IT Law, as well as in Ethics. She has also worked as a Consultant for UNESCO at the Cultural Diversity section. Her fields of expertise include Intellectual Property and Cultural Heritage Law, Protection of Personal Data, Tech Law as well as Ethics.

convictions for all the relevant offences of illicit trafficking in cultural goods. However, such an impact is necessarily tempered due to the specificity of this kind of illicit trafficking, as well as the technical and conceptual constraints of the blockchain itself. Even though blockchain in its current form cannot overcome the legal obstacles which hamper the efficacy of the fight against illicit trafficking, such as the lack of harmonization of legal systems, its value in this area should not be dismissed altogether. An overview of the relevant international and European norms, highlighted using national law examples, reveals the complementary role that blockchain can have in this field, not only in terms of best practices but also in terms of an increased visibility for cultural goods and their international movement.

Keywords: blockchain, illicit trafficking, due diligence, criminal law

Introduction

Opinions are divided over whether illicit trafficking in cultural property is the second, third, or fourth most lucrative unlawful trade, and if it generates a profit closer to hundreds of millions or to billions of Euros.[1] However, everybody agrees that it is a thriving international criminal enterprise that causes harm and distress to states, museums, and individuals deprived of the ownership, study, and enjoyment of cultural heritage. It also has the potential to fuel wide-scale criminal and terrorist activity.

Illicit trafficking in cultural goods can be defined as the import, export, and transfer of possession and/or ownership of items being of importance for archaeology, prehistory, history, literature, art, or science, in breach of national laws as well as international and European regulations.[2] It involves crimes ranging from theft from cultural heritage institutions or private collections to fraud, handling of stolen property and money laundering, looting of archaeological sites, clandestine excavations, to the displacement of artefacts due to war. Illicit trafficking in cultural goods is distinct from other types of trafficking because of the existence of a legal market, accessible to everybody, for cultural objects. Unlike trafficking in

[1] See P. Singh, S. Singh, *An Affair of the Art: Contemporary Reflections on the Legal Dimensions of International Art Theft*, "Art Antiquity and Law" 2019, Vol. 24(3), pp. 242-243.

[2] Article 3 of the 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property (14 November 1970, 823 UNTS 231) defines illicit trafficking as the import, export, or transfer of ownership of cultural property effected contrary to the provisions adopted under this Convention by the States Parties thereto.

drugs or human beings, illicit trafficking in cultural goods does not depend on the nature of what is being trafficked, but rather on the nature of the ownership and/or possession of the cultural object.[3] It is therefore the legality of the ownership rights that marks the boundary between "illicit" and "licit" trade in cultural objects.

At the same time, the legal market can quite often act as a "laundry market"[4] or as a "grey market", where illegally-obtained antiquities or art items can become legal.[5] This intermixing between the legal and the illegal is supported by the specificities of, and in some cases the flaws in the art and antiquities market, such as the restricted supply and the high demand; the extreme privacy amounting to sheer anonymity surrounding numerous transactions; the ambiguity relating to ownership verification of cultural goods; or the differences among national regulatory rules.[6] These "specificities" explain why even though more items are accompanied by provenance certificates now than in the past, a very large number of them are still sold with no clear and indisputable provenance documentation, raising doubts about their legal ownership.[7]

This means that the regulatory framework at the EU, international, and national levels, which rests upon the prohibition of illicit antiquities, won't be of any real help if there are no reliable means and no real will to distinguish legal objects from the illegal ones.[8] Provenance establishment is a critical element for such a distinction. As a chain of title or history of ownership of a cultural object,[9] provenance plays a key role in the due diligence investigatory process, and is instrumental in litigation matters involving all kinds of ownership disputes and recovery claims. Moreover, clarity and the accessibility of provenance information can act as a deterrent to crimes related to illicit trafficking in cultural goods, by facilitating criminal investigations and convictions and preventing illegal transactions. Indeed, it is asserted that "higher provenance standards reduce the chances that law-abiding

3 ICOM International Observatory on Illicit Traffic in Cultural Goods, *What Is Illicit Traffic?*, https://www.obs-traffic.museum/what-illicit-traffic [accessed: 14.05.2023].

4 The term "laundry market" refers to a market where criminals do not only launder illegally obtained money, but also illegally obtain goods through their commercialization in that specific market. The art market is a prominent example of a market where both money and works of art are being laundered. See more in G. Lambert, *Blanchiment et marché de l'art: le droit et la pratique*, L'Harmattan, Paris 2020, pp. 11-46.

5 See more in ibidem, pp. 58-61.

6 For the specificities of the art and antiquities market favouring illicit trafficking, see T. Moskowitz, *The Illicit Antiquities Trade as a Funding Source for Terrorism: Is Blockchain the Solution?*, "Cardozo Arts & Entertainment Law Journal" 2019, Vol. 37(1), pp. 212-213; K. Hill, *The Problem of Auction Houses and Illicit Antiquities: A Call for a Holistic Solution*, "Texas International Law Journal" 2016, Vol. 51(3), p. 342; H.D. Willett, *Ill-Gotten Gains: A Response to the Islamic State's Profits from the Illicit Antiquities Market*, "Arizona Law Review" 2016, Vol. 58(3), pp. 839-840.

7 See N. Brodie, *Uncovering the Antiquities Market*, in: R. Skeates et al. (eds.), *The Oxford Handbook of Public Archaeology*, Oxford University Press, Oxford 2012, p. 253.

8 See D. Fincham, *Assessing the Viability of Blockchain to Impact the Antiquities Trade*, "Cardozo Arts & Entertainment Law Journal" 2019, Vol. 37(3), p. 618.

9 T. Moskowitz, op. cit., p. 213.

and legitimate institutions, collectors and vendors contribute to the cycle of looting and destruction of archaeological sites – and the irreparable loss of historical context and information that goes hand in hand with looting".[10]

The purpose of this article is to argue that blockchain technology can offer a heightened scrutiny in the art and antiquities trade and markets by helping to distinguish the legal from the illegal, thus making an impact in both the due diligence and criminal law fields. Therefore, after a brief presentation of blockchain technology, we will discuss its use and impact on due diligence and criminal law contexts, and follow with some concluding remarks.

Blockchain Technology

Blockchain first appears in the white paper bearing the title *Bitcoin: A Peer-to-Peer Electronic Cash System*, signed by Satoshi Nakamoto (it is unknown if this is the real name of a person or a pseudonym of a person or group of persons).[11] The paper was published in 2008, i.e. at the heart of the global financial crisis that questioned the financial system and the role of financial institutions. It proposed the creation of a decentralized digital trading system. Blockchain technology became popular because of its decentralized character, meaning its ability to facilitate transactions with monetary value without being controlled by a central system.[12]

Blockchain technology aims to refine the business world and all types of transactions; it came just after the Information Society, i.e. the first generation of the internet which reformed the information system.[13] It is an information management system that enables secure, transparent, and automated transactions in a cost-effective way.[14] It presents two main characteristics: a) it is a Distributed Ledger Technology (DLT)[15] and – as such – is based on the sharing of all information among

[10] J.A. Levine, *The Importance of Provenance Documentation in the Market for Ancient Art and Artifacts: The Future of the Market May Depend on Documenting the Past*, "DePaul Journal of Art, Technology & Intellectual Property Law" 2009, Vol. 19(2), p. 221.

[11] The paper is publicly available online: S. Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, https://bitcoin.org/bitcoin.pdf [accessed: 14.05.2023].

[12] However, as will be demonstrated in this paper, blockchain is a very useful technological tool even in relation to fields where decentralization is not applicable, or is inefficient.

[13] "Blockchain has the ability to trigger a generational shift from an internet of information to a new-generation internet of value", European Commission, *Distributed Ledger Technologies (DLTs) and Blockchains*, 18 March 2020, https://knowledge4policy.ec.europa.eu/foresight/topic/accelerating-technological-change-hyperconnectivity/blockchain-cryptocurrency_en [accessed: 14.05.2023].

[14] E. Kokotsaki et al., *The Application of Blockchain Technology in Copyright Field: Formalities and "Smart Contracts"*, in: *12th International Conference on Information, Intelligence, Systems & Applications (IISA)*, 2021.

[15] DLT is "an approach to recording and sharing data across multiple (decentral) data stores (or ledgers). This technology allows for transactions and data to be recorded, shared, and synchronised across a distributed network of different network participants", European Parliament, *Intellectual Property Rights and Distributed Ledger Technology with a Focus on Art NFTs and Tokenized Art*, October 2022, p. 11, https://www.europarl.europa.eu/RegData/etudes/STUD/2022/737709/IPOL_STU(2022)737709_EN.pdf [accessed:

the participants of the system (data are stored in blocks); and b) it enables automated transactions through smart contracts which permit the automatic execution of an agreement.

It has already been used in all sectors of social, economic, and public life: banks and finance;[16] insurance;[17] trademarks;[18] property/real estate;[19] authenticity and traceability of products (especially luxury products);[20] energy;[21] e-voting;[22] e-government;[23] logistics and supply chain;[24] healthcare;[25] gaming;[26] and works of art. Specifically in the field of arts and culture, blockchain has been applied in the field

14.05.2023]; "A store of data that is intended to be final, definitive and immutable, where the store is shared across a network of computers (NODES)", European Law Institute, *ELI Principles on Blockchain Technology, Smart Contracts and Consumer Protection*, 2023, p. 19, https://www.europeanlawinstitute.eu/fileadmin/user_upload/p_eli/Publications/ELI_Principles_on_Blockchain_Technology__Smart_Contracts_and_Consumer_Protection.pdf [accessed: 14.05.2023].

16 European Banking Authority, *Report with Advice for the European Commission on Crypto-assets*, 9 January 2019, https://www.eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493daa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf [accessed: 14.05.2023].

17 European Insurance and Occupational Pensions Authority, *Discussion Paper on Blockchain and Smart Contracts in Insurance*, 2021, https://www.eiopa.europa.eu/system/files/2021-04/eiopa-discussion-paper-on-blockchain-29-04-2021.pdf [accessed: 14.05.2023].

18 See, for example, European Union Intellectual Property Office, *EUIPO Connects to TMview and DesignView through Blockchain*, 27 April 2021, https://euipo.europa.eu/ohimportal/en/-/news/euipo-connects-to-tmview-and-designview-through-blockchain?TSPD_101_R0=089375ec4aab20005991aadc25bddd773b3fe4ee7e005c416d1627f2f2fe27f9a4d94cf90e3096bb0809735b32143000014b779a1ee4a9cc4526e1c200aa649d8238aeb078f04b6ac9fc1bf7bc739df4a5695d2b61602220dc6e121f8554c45e [accessed: 14.05.2023]; as explained "Blockchain improves speed while maintaining high quality data transfers. Data integrity and security is taken to another level, thus opening the door to new services that will improve connectivity between users and their IP rights, and which will speed up inter-IP Office procedures".

19 O. Konashevych, *Constraints and Benefits of the Blockchain Use for Real Estate and Property Rights*, "Journal of Property, Planning and Environmental Law" 2020, Vol. 12(2), pp. 109-127; R.M. Garcia-Teruel, *Legal Challenges and Opportunities of Blockchain Technology in the Real Estate Sector*, "Journal of Property, Planning and Environmental Law" 2020, Vol. 12(2), pp. 129-145.

20 See, for example, the Aura Blockchain Consortium, which was "created in April 2021 by LVMH, Prada Group and Cartier, part of Richemont. Together with the OTB Group that joined in October 2021 and Mercedes-Benz in May 2022, it has the aim to develop the applications of blockchain technology and raise the standards of luxury", https://auraluxuryblockchain.com [accessed: 14.05.2023].

21 G. Fulli et al., *Blockchain Solutions for the Energy Transition: Experimental Evidence and Policy Recommendations*, Publications Office of the European Union, Luxembourg 2022.

22 P. Baudier et al., *Peace Engineering: The Contribution of Blockchain Systems to the E-voting Process*, "Technological Forecasting and Social Change" 2021, Vol. 162.

23 M. Kassen, *Blockchain and E-government Innovation: Automation of Public Information Processes*, "Information Systems" 2022, Vol. 103.

24 European Parliamentary Research Service, *Blockchain for Supply Chains and International Trade: Report on Key Features, Impacts and Policy Options*, May 2020, https://www.europarl.europa.eu/RegData/etudes/STUD/2020/641544/EPRS_STU(2020)641544_EN.pdf [accessed: 14.05.2023].

25 The European Union Blockchain Observatory and Forum, *Blockchain Applications in the Healthcare Sector*, 2022, https://www.eublockchainforum.eu/sites/default/files/reports/eubof_healthcare_2022_FINAL_pdf.pdf [accessed: 14.05.2023].

26 For example, 0xGames, https://0x.games.

of copyright and management of works (or other subject matter) protected by copyright. NFTs (Non-Fungible Tokens) is also a relatively new trend in the field of the art market, where it serves as a "cryptographic tool that uses a blockchain to create a unique, non-fungible digital asset which can be owned and traded".[27] A number of blockchain-based applications for the special needs of the art-related market have been launched, but none dealing with the antiquities trade.[28]

Types of blockchain

As explained above, blockchain became famous because of its decentralized character. However, decentralization is not a feature that describes the essence of the operation of the technology. It is not a necessary element for its operation, but a possible property, which can be useful or non-useful to the one applying the technology, depending on the field. Three main types of blockchain currently exist: public, private, and hybrid.

The classification may change according to the researched field; in relation to the compliance of the blockchain technology with GDPR, the European Union distinguishes between public and private, then further splitting private into permissioned and permissionless. In other cases, the legal doctrine distinguishes between: (1) public permissioned blockchains; (2) public permissionless blockchains; (3) private permissioned blockchains; and (4) private permissionless blockchains.[29] Considering that our purpose is to highlight that the blockchain technology is important for the cultural sector, and specifically in the area of illicit trafficking of cultural goods, even when it is not decentralized, and the key question is which entity controls the ledger – as will be explained shortly – we have adopted a three-level categorization: public, private, and hybrid.

Public blockchains are not supervised by a central authority; neither permission to access the ledger is needed nor control to read and add data. The public auditability of these ledgers enhances transparency, but minimizes privacy.[30] Typical examples of this kind of blockchain are Bitcoin and Ethereum. Inasmuch as public

[27] European Parliament, op. cit., p. 13.

[28] A thorough analysis is provided in N. Brodie et al., *Illicit Trade in Cultural Goods in Europe: Characteristics, Criminal Justice Responses and an Analysis of the Applicability of Technologies in the Combat Against the Trade*, Publications Office of the European Union, Luxembourg 2019, p. 47: Verisart – which uses blockchain to create a ledger of "permanent digital records for a physical artwork", referring to these records as certificates; Artory – a blockchain-based art provenance registry; Codex Protocol – a blockchain-based provenance registry for art and collectables; Maecenas – a blockchain-based platform through which users invest in/take partial ownership of percentages of the value of a work of art so that the owner of the work of art can raise money; and Fimart – a blockchain-based "fractional marketplace of art".

[29] European Law Institute, op. cit., p. 26.

[30] European Parliamentary Research Service, *Blockchain and the General Data Protection Regulation: Can Distributed Ledgers Be Squared with European Data Protection Law?*, July 2019, p. 5, https://www.europarl.europa.eu/RegData/etudes/STUD/2019/634445/EPRS_STU(2019)634445_EN.pdf [accessed: 14.05.2023].

blockchain operates through multiple servers based on a consensus model, it is considered to be more democratic and transparent, because anyone can download the entire ledger and view transaction data.

Private blockchains are supervised by a single entity or a consortium. Permission is needed to enter the system as a user and access to, control over, and reading or adding data is administered on an invitation basis. Consortium blockchains present a more decentralized character than private single entity ones, resulting in higher levels of security. In private blockchain systems, parties' identity is usually known – at least to the gatekeeper granting permission to join the network.

A hybrid blockchain is a combination of the public and private blockchain. It is supervised by a single organization (or a consortium), but it includes features of the public blockchain: some features are accessible by everyone without permission, while for some others permission is needed. The ledger in this case is customized according to the specific needs of the entity, by applying the decentralized approach for some actions and a centralized approach for others. Therefore, the level of decentralization, transparency, and security may change according to the specific needs of the field it is applied to.

In general, blockchain is a system that permits participants, called "nodes", connected to each other with a peer to peer network, to record information (data including transactions) in a database or a ledger. These registered data are shared among the participants (all or some of them, depending on the type of the blockchain that is applied, as will be explained shortly). The nodes function as storage devices that maintain a copy of the database which contains the recorded information.

How a blockchain works

In a public blockchain, the information introduced into the system is shared among all nodes. The information can be inserted into the system (the database) only if it has been validated by the participating nodes; this is a necessary process as there is no centralized entity auditing the ledger. Validation will be made based on consensual algorithms which are used to build trust between the – unknown to each other – participants. The consent algorithm may take different forms (such as Proof-of-Work[31]

[31] European Commission, *European Blockchain Services Infrastructure: Newsflash*, https://ec.europa.eu/newsroom/cef/newsletter-archives/35323 [accessed: 14.05.2023]. "Proof-of-Work (PoW) is a consensus mechanism that ties mining capability to computational power. In the case of blockchain, blocks must be hashed, which is in itself an easy computational process, but an additional variable is added to the hashing process to make it more difficult (a 'nounce'). This process takes time and computational effort (by the 'miner'). These two components provide a certain monetary value to the block and the miner is therefore rewarded. This is why a hashed block is considered proof of work. The main goal of a PoW system is to deter cyber-attacks such as a distributed denial-of-service attack (DDoS), which has the purpose of exhausting the resources of a computer system by sending multiple fake requests".

and Proof-of-Stake,[32] which are the most well-known examples) and is decided upon when setting the blockchain system. In the validation process, the participating nodes (usually called miners in this type of blockchain) are trying to resolve a difficult mathematical problem and convert the information into a unique 32-character length string that is called hash. When hashed, the data is linked with the preceding hash creating a chain of data which is shared with all nodes. The miner who resolved the mathematical problem for the validation of the data gets a prize, a compensation, usually (virtual) money. Typical examples of this kind of blockchain are Bitcoin and Ethereum.

In a public blockchain, the fact that all participants share the same information ensures that the system cannot be corrupted, or fail. For the registry to be falsified, 51% of the ledgers' copies must be modified at the same time, or one must acquire 51% of the computing power nodes, which is rather difficult (although not impossible).[33]

In a private blockchain, the nodes will be supervised by the entity or consortium that controls the system. The validation of the information (data or transaction) is made by the entity or the consortium that sets up the system, or by the specific nodes that have been appointed for this purpose (for example a specific employee having access to specific information).

In a hybrid blockchain, some information is validated by the entity setting up the system, and some other information may be left in a decentralized way.

The information inserted into the block depends on the type of field, or business that applies the technology; in general terms it includes the following:

1. The asset that is recorded in the database, such as an ownership status or a transaction; for example: <Galatea owns an ancient Greek amphora>, or <Galatea is selling to Vissarion an amphora>;
2. The identity of the block (unique number) which is obtained by the hashing process. As explained, it is linked to the identity of the previous block with which it is tied (unique number of previous block);
3. A timestamp: once the process is validated by the participating nodes, it receives a timestamp. Validation of the information is made by the participating nodes.

[32] Ibidem. "Proof-of-Stake (PoS) is a consensus mechanism and has the same overall process and goal as Proof-of-Work, the method to reach that goal is however entirely different. Miners are replaced by validators that lock some of their assets as a stake in the ecosystem. Following that, the creator of the next block is chosen via different combinations of random selection, based on the staked amount or the time the amount has been staked. When blocks get added to the chain, validators get a block reward in proportion to their stake".

[33] J. Bursztynsky, *Feds Seize $3.6 Billion in Bitcoin Stolen from Bitfinex Hack*, "CNBC", 8 February 2022, https://www.cnbc.com/2022/02/08/feds-seize-3point6-billion-stolen-from-bitfinex-hack.html [accessed: 14.05.2023].

To summarize, the blockchain process involves:

(i) a P2P network which hosts and synchronizes a copy of the entire blockchain;

(ii) nodes, who have access to the database and are following specific rules to validate a data/transaction:
   a) in a public blockchain, miners or validators who solve complex cryptographic puzzles and distinguish legitimate transactions from illegitimate ones, based on the consensus model of the network,
   b) in a private blockchain, the nodes are chosen by the supervising entity,

(iii) users, natural or legal persons who sign and submit transactions to the system. Users register in the system. They have an account number which is a public key shared with others (the identity of the individual may be hidden) and a password which is a private key (also a string of letters and numbers).

Smart contracts specifically

Blockchain, apart from being a distributed ledger, also contains a very important feature, the so-called "smart contracts", which are parts of software that contain contractual terms.

Smart contracts are used to implement escrow systems, automate royalty payments, manage digital collectibles, organize decentralized marketplaces, enable decentralized finance ("DeFi"), help with prediction markets integrity, etc.[34] They can also be used in art sales in order to guarantee the ownership rights of the vendor, traceability of the cultural object's provenance, and of course the security of the transaction, since the vendor will be paid in the end.

"Smart contracts" are, essentially, pieces of software that contain terms and deadlines; they are information protocols that execute the terms of a contract.[35] The software runs according to the following mechanism: "if" the program finds the fulfilment of a pre-programmed condition, "then" it automatically executes the terms of the contract (e.g. payment, transfer of ownership, etc.).[36] This automated execution of a contract makes smart contracts particularly appealing.

[34] T. Schrepel, *Smart Contracts and the Digital Single Market Through the Lens of a "Law + Technology" Approach*, Publications Office of the European Union, Luxembourg 2021, p. 17.

[35] D. Legeais, *BLOCKCHAIN*, "Jurisclasseur", Fasc. 534: "Les smart contracts sont des algorithmes de gestion des opérations contractuelles. Le smart contract se présente comme la concrétisation d'un vaste mouvement que l'on nomme l'automation. Les smart contracts ne sont pas des contrats. Ce sont des protocoles informatiques qui vont exécuter les termes d'un contrat. La blockchain peut ainsi exécuter des programmes. Les programmes sont répliqués avec les faits et tous les nœuds les exécutent lorsqu'ils reçoivent les faits".

[36] Simmons & Simmons LLP, *Blockchain – Le droit et la technologie blockchain: une approche sectorielle*, "Contrats Concurrence Consommation" 2017, Vol. 10.

The agreement between the counterparties is registered into the chain: <Galatea is selling the amphora>. Smart contracts automate the execution of the contract: <the ownership status changes, once Vissarion transfers the amount from his accounts to Galatea>. The contract then fulfils the obligation undertaken by the party, such as in our example: <Vissarion is registered as the owner of the amphora>. Obviously, the amphora cannot be literally handed over to Vissarion as it is a physical object whose value is inherent to its existence in the physical world. Therefore, no one can in this case guarantee that Galatea will deliver the amphora to Vissarion.

If the object is digital or digitized and retains its initial value, breach of contract would be impossible. The automation would not allow derogations (for example, if there is no money in the account of the paying party, the supply stops automatically).

In our example, the transaction concerns a tangible material, an amphora, that cannot be digitized, or if digitized it loses its value (the digitized amphora does not have the same value as the amphora itself as a unique object). It is interesting to note though, that even in this case, i.e. when the cultural object is digitized (for example the digitized image of the amphora), blockchain technology could still prove to be a very valuable tool: it could serve as an information management tool for the public dissemination of the cultural object. Imagine, for example, the cultural objects owned by a museum digitized and disseminated all over the world. And to go further, in this case blockchain technology, through its smart contracts, could also be used as a management tool for the commercialization of the digitized image of the cultural object (for example the use of the image of the amphora in an advertisement). Actually, in this latter case the transaction could be automated – use of the item for commercial purposes would be realized only if the amount was paid.[37]

In the same context, if the owner of the cultural object – an antiquity for example – digitizes the object and then mints it into an NFT,[38] the objective, intrinsic value of the cultural object cannot be regained; it is still lost. Only digitally created artworks could have an actual value. When a physical cultural object is represented by the NFT, "the content is primarily the metadata (i.e. a description of the specifications) of the asset (e.g. title, author, measurements; or address, lot number, measurements; depending on the asset)",[39] and any image of the physical object

[37] To take a more extreme step, one could argue that NFTs could also be applicable in the domain of the trade of cultural goods of this nature (antiquities for example), but this falls outside the present research paper.

[38] "'Minting' refers to the process of publishing a token ID for the unique token on a blockchain. [...] The order to mint an NFT executes a code stored in the smart contract, which leads to the following steps: (1) Creating a new block; (2) validating information; (3) recording information into the blockchain". European Parliament, op. cit., p. 15.

[39] Ibidem.

potentially associated to the NFT will have "a merely descriptive function in order to sell the NFT itself and is not part of the NFT as such".[40] In any case, the NFTs of the digitized object could still represent a certain financial value as a digital asset that can be offered for auctions for example.[41]

A synopsis of the blockchain technology and its application in trade in cultural goods

Based on the analysis above, in a simplified way one could describe blockchain as a technology that: a) is a ledger, a database, or a register of information such as ownership or provenance of objects/assets or transactions related to such objects which is shared with all participants; b) certifies the object of the transaction and is able to locate it at any time; c) allows, through smart contracts, the automatic execution of transactions.

Perceived from the angle of cultural goods, the first and second characteristics could play a significant role in the case of illicit trafficking of tangible cultural goods, while the third is in a position to reshape the cultural heritage field when the cultural object is digitized, permitting the dissemination of the goods and the management of such dissemination.

More specifically, as an information management system blockchain technology is a technological solution that can be used for transactions of both physical and digital assets. When a transaction involves assets the value of which relies in their immaterial form, i.e. digital by nature or digitized objects, blockchain technology deploys its full functionalities and flourishes. Think for example of a musical or audiovisual work, either created digitally or digitized: in this case blockchain technology enhances the market value of the object of the transaction through the smart contracts, enabling automatic transactions in a cost-effective way.

When it comes to those assets the value of which are linked to their physical, material form and therefore their uniqueness, blockchain remains a valuable tool that functions mainly as a registry and an inventory; imagine for example a statue, or the amphora of our example: before digitization of the asset, blockchain technology may mainly contribute to certifying ownership, locating the cultural good, or recording its movement. In this case blockchain technology may, depending on the technical choices made (public, private, or hybrid blockchain), contribute to reinforcement of the legal requirements of due diligence. When these material, unique objects are digitized (a digital picture of the statue for example), their nature is transformed and this effect on their nature may diminish their value;

40 Ibidem.

41 Considering that in this article we are examining the effectiveness of the blockchain technology in the art and antiquities trade when distinguishing the legal from the illegal, we will not elaborate any further on NFTs.

however, even in this case blockchain technology is a useful tool that could contribute to the management of the dissemination of the digitized cultural good, or even the commercialization of its image.

Considering the above, the application of blockchain in cultural goods can function as an information management system that can certify the provenance and movements of cultural goods, contributing to the reinforcement of the legal requirements of due diligence.

The Impact of Blockchain on Due Diligence Requirements

The due diligence requirement is at the centre of the illicit trafficking in cultural goods since it is linked to questions of ownership and provenance, which are among the main problems in the antiquities market.

The notion of due diligence refers to "the attention and care required from a person in a given situation"[42] and can be defined as an "action that is considered reasonable for people to be expected to take in order to keep themselves or others and their property safe".[43] The exercise of due diligence is necessary so that the purchaser of a cultural good which does not belong to the seller and has been unlawfully removed from its rightful owner can be considered a good faith purchaser and obtain compensation.[44] Good faith and due diligence are connected, since due diligence contributes to identifying the notion of good faith.[45] "Good faith possession" is taken to mean a subjective state of mind consisting in ignorance as to the illegitimate provenance of the object.[46] Therefore, due diligence actually establishes a rule of behaviour, a rule of good conduct, which must be adopted by the possessor in order to meet the "good faith purchaser" standard.[47]

The criteria that must be taken into account in order to meet this standard are laid down in the 1995 UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects.[48] According to Article 4(4), in determining whether the possessor exercised due diligence, regard shall be had to all the circumstances of the acquisition, including the character of the parties, the price paid, whether the possessor

42 *Diligence*, in: *Black's Law Dictionary*, 11th ed., 2019.

43 *Due Diligence*, in: *Cambridge Dictionary*, https://dictionary.cambridge.org/us/dictionary/english/due-diligence [accessed: 14.05.2023].

44 F. Francioni, *Cultural Property in International Law*, in: M. Graziadei, L. Smith (eds.), *Comparative Property Law*, Edward Elgar Publishing, Cheltenham 2017, pp. 393-411.

45 L. Casertano, *Combatting the Illicit Trafficking of Cultural Property: The Multifaceted Response to a Complex Challenge*, "Global Jurist" 2020, Vol. 20(1), p. 5.

46 Ibidem.

47 Such a standard is set in Article 4(4) of the 1995 UNIDROIT Convention as well as in Article 10 of the EU Directive 2014/60 (see below).

48 24 June 1995, 2421 UNTS 457.

consulted any reasonably accessible register of stolen cultural objects, and any other relevant information and documentation which it could reasonably have obtained, and whether the possessor consulted accessible agencies or took any other step that a reasonable person would have taken in the circumstances.

The same criteria can be also found in Article 10 of EU Directive 2014/60 on the return of cultural objects unlawfully removed from the territory of a Member State,[49] according to which:

> In determining whether the possessor exercised due care and attention, consideration shall be given to all the circumstances of the acquisition, in particular the documentation on the object's provenance, the authorisations for removal required under the law of the requesting Member State, the character of the parties, the price paid, whether the possessor consulted any accessible register of stolen cultural objects and any relevant information which he could reasonably have obtained, or took any other step which a reasonable person would have taken in the circumstances.

By taking into account the consultation of accessible registers of stolen cultural objects, and the search for any other relevant information and documentation which it could reasonably have obtained, it is clear that in both texts due diligence is linked to this specific mode of provenance research. This "pragmatic" definition of due diligence[50] attached to provenance research aims at harmonizing the relevant national law of Member States by avoiding references to a term like "good faith", which is interpreted differently among national legal systems.[51] Even though such

[49] Directive 2014/60/EU of the European Parliament and of the Council of 15 May 2014 on the return of cultural objects unlawfully removed from the territory of a Member State and amending Regulation (EU) No 1024/2012 (Recast), OJ L 159, 28.05.2014, p. 1. Largely based on the Council Directive 93/7/EEC of 15 March 1993, the 2014 Directive was also influenced by the 1995 UNIDROIT Convention. For the similarities and the differences between the Convention and the Directive, see G. Magri, *The Impact of the UNESCO and UNIDROIT Conventions and the EU Directives on the International Art Market: An Analysis Fifty Years after the Introduction of the Obligation to Return Stolen or Illegally Exported Cultural Goods*, "Brazilian Journal of International Law" 2020, Vol. 17(3), pp. 62, 67-71 ; M. Frigo, *The Implementation of Directive 2014/60/EU and the Problems of the Compliance of Italian Legislation with International and EU Law*, "Santander Art and Culture Law Review" 2016, Vol. 2(2), pp. 76-77 ; M. Cornu, *Recasting Restitution: Interactions between EU and International Law*, "Uniform Law Review" 2015, Vol. 20(4), pp. 642-644.

[50] L. Casertano, op. cit., p. 5.

[51] While most legal orders provide for an exception to the protection of a *bona fide* acquirer in case the acquired goods have been stolen, conditions on how to apply this exception can differ significantly, especially regarding limitations on the time in which the owner can revindicate his property. Differences on the role of good faith in the acquisition of property rights on stolen antiquities can be observed between Common and Civil Law systems. In Civil Law systems good faith of the purchaser will give him a good title together with the application of the market overt exception. On the contrary, following an 18th century rule that *bona fides* cannot establish a right, good faith has a diminished capacity in actively conveying property rights in Common Law. Despite their differences in this regard, Common Law systems seem to adhere to the rule that no one can transfer title to a stolen property (*nemo dat quod non habet*). In England and Wales the market overt exception is abolished and no general exception to the *nemo plus juris* rule can benefit the good faith acquirer. In Scots Law, the owner of a stolen good has an imprescriptible right to recover it. United States, Cyprus, and Northern Ireland follow the example of English Law. See more in: O. Gemmell, *Is Good*

a harmonization is not yet the case because the notion of due diligence is still an object of divergence among EU Member States,[52] the link between due diligence and database and register consultation can be found also in soft law texts.

Indeed, various codes of ethics adopted by museums and art trade associations specify the term "due diligence" either by simply referring to the verification of the ownership history or by explicitly requiring the consultation of a database, although there is no uniformity as to the conditions that trigger such a requirement, in particular with respect to the price of the item. This is the case, for instance, regarding the ICOM Code of Ethics for Museums, which requires that due diligence should establish the full history of the item since its discovery or production,[53] or the Guidelines of the French Regulation Authority on Voluntary Sales of Chattels by Public Auction, which considers the consultation of a database as a necessary step for provenance verification by explicitly requiring that operators of such public auctions consult "available French and international databases".[54] However, other soft law texts of this kind are more explicit as to the conditions for such an obligation. Such examples can be found in the Code of Ethics and Practice of the International Association of Dealers in Ancient Art (IADAA), which requires all members to check objects with a purchase value exceeding €5,000 against a database of stolen art approved by the Board, such as The Interpol Database of stolen art or The Art Loss Register.[55] Similarly, the Code of Ethics of the Swiss Association of Dealers in Antiques and Art (SADAA) states that consultation of The Art Loss Register is compulsory for acquisitions in excess of 25,000 Swiss Francs.[56]

Despite their differences, these codes of ethics follow the example of national laws and apply the requirement of inquiry into relevant registers only to professionals in the field of antiquities trade,[57] whereas the 1995 UNIDROIT Convention and

Faith Leaving a Bad Taste? The Role of Good Faith in the Transfer of Corporeal Property in Scots Law, "Edinburgh Student Law Review" 2021, Vol. 4(2), pp. 15-19 ; D. Stoyanov, *The Conflict between the Legal Interests of the Original Owner and the Good Faith Acquirer of Movables: A Comparative Overview of the Solutions*, "Lex ET Scientia International Journal" 2015, Vol. 22(1), pp. 93-107; R.L. Tucker, *Stolen Art, Looted Antiquities, and the Insurable Interest Requirement*, "Quinnipiac Law Review" 2011, Vol. 29, pp. 625-627 and 630-634; C. Rose, *The Transfer of Property Rights by Theft: An Economic Analysis*, "European Journal of Law and Economics" 2010, Vol. 30(3), pp. 252-255 ; D. Fincham, *Towards a Rigorous Standard for the Good Faith Acquisition of Antiquities*, "Syracuse Journal of International Law and Commerce" 2010, Vol. 37(2), pp. 160-170.

52 L. Casertano, op. cit., p. 5.

53 ICOM, *Code of Ethics for Museums*, 2017, para. 2.3, https://icom.museum/wp-content/uploads/2018/07/ICOM-code-En-web.pdf [accessed: 14.05.2023].

54 Indeed, para. II 1.5.1 of the *Guidelines* (*Lignes directrices du Conseil des Ventes Volontaires de Meubles aux Enchères Publiques*) imposes such an obligation on art professionals.

55 International Association of Dealers in Ancient Art, *Code of Ethics and Practice*, Art. 8, https://iadaa.org/about-us/ [accessed: 14.05.2023].

56 Swiss Association of Dealers in Antiques and Art, *Ethikcode*, Introduction and Title III, http://www.vsak.org/Ethikcode.pdf [accessed: 14.05.2023].

57 For instance, the law in England and Wales and Switzerland does not consider checking a database to be a requirement of good faith for non-professionals or non-collectors. The same was also the case for

the EU Directive 2014/60 do not distinguish between professionals and non-professionals. However, the important questions of when somebody is required to further search the provenance; in what circumstances; what standard of suspicion makes such a research mandatory; and for whom; have yet to be answered unanimously. The *in concreto* approaches of national courts, which decide on an *ad hoc* basis without any clearly defined pre-established criteria, causes national practices to significantly diverge on this matter.[58]

Nevertheless, such disparities cannot undermine the importance of the requirement of database consultation, given that the information contained in them is essential to avoiding stolen or looted antiquities from entering the legal market by private or public transactions. Such importance explains the variety of databases on lost and stolen art, in particular in terms of their scope, focus, or even accessibility.[59] Hence, databases on lost and stolen art can be distinguished between national and international databases;[60] between databases containing all[61] or specific stolen art items;[62] as well as between databases that are publicly accessible and those that are restricted to authorized members.[63] In a similar manner, in order to further assist law enforcement agencies the International Council of Museums (ICOM) publishes red lists of cultural property at risk of illegal exportation.[64]

However, the growth in the quantity of these databases has not necessarily improved provenance research, and subsequently the fight against the illicit

EU Member States, such as Greece and France, before the 2014 Directive. In general, national case-law decides on an *ad hoc* basis. See N.M. Neuhaus, S. Balay, *Databases on Lost and Stolen Art: Is Consulting a Database an Inherent Requirement of Good Faith?*, "Art Antiquity and Law" 2014, Vol. 19(2), pp. 169-175.

58 For more on the discretion left to national courts in this field, see G. Magri, op. cit., p. 69.

59 For an overview of databases on lost and stolen art, see N.M. Neuhaus, S. Balay, op. cit., pp. 170-176.

60 For example, the TREIMA in France for endangered and stolen objects, held by the Central Office for the Fight against Illicit Traffic in Cultural Goods of the Police, or the ARTIST in Belgium, held and accessed by the Belgian Police.

61 The databases with the widest focus are mostly police databases, such as Interpol's Stolen Works of Art Database; the Italian Carabinieri's National Stolen Cultural Property Database; The London Metropolitan Police's Stolen Arts Database; the French TREIMA; or the FBI's National Stolen Art File (NSAF).

62 Like the Looted Art Database of the Commission for Looted Art in Europe, the German Lost Art Internet Database and the Dutch database Origins Unknown, which focus on objects stolen or confiscated during the Second World War.

63 Such is the case, for instance, regarding Interpol's Stolen Works of Art Database, which although it grants access to the public still requires registration in order to use the database. On the contrary, the Art Loss Register, the world's largest private database, gives no direct access to the public, which can only search it for a fee. Similarly, ArtClaim, another private database, is available only to certain government and cultural institutions, and to law enforcement agencies.

64 ICOM's red lists aim to identify categories of endangered cultural objects that are at risk of pillage, looting, theft, or clandestine excavation, with a view to enable law enforcement and cultural heritage/museums professionals and collectors to be alerted when they encounter artefacts similar to the ones presented in the list. See more in: https://icom.museum/en/resources/red-lists/ [accessed: 14.05.2023].

trade of cultural goods. The main reasons for this are the lack of coordination, communication, and harmonization regarding the input, use, or access to such systems of information.[65] Indeed, since all these databases remain individual and uncoordinated, the system of information that they create is bound to remain fragmented and therefore confusing to both law enforcement officials as well as art or antiquities professionals and owners.[66] The lack of uniformity regarding both the conditions of access and the conditions that trigger the obligation to consult a database[67] can seriously deter the stakeholders from actually consulting them. The same holds true for the lack of common standards of documentation regarding provenance research, which is linked to the variety of databases that have different registration requirements, which in turn can seriously hamper the credibility of provenance research through databases since it can facilitate the falsification of provenance records.[68] Furthermore, the cost of provenance research, both in terms of time and money, means that many hours and large research expenses are required given the amount of databases that have to be consulted in order to dissipate any doubts on an item's provenance,[69] which in turn obviously can discourage consultation of all available databases. As a result, even the large number of available databases cannot remedy the problem of severe underreporting of thefts, which compromises their accuracy, because the victims would have to report the theft to multiple databases in order to enhance the chances of recovery.[70]

All these problems indicate that the centralization of existing databases could improve provenance research in this field, inasmuch as it would facilitate the elimination of both the registration and accessibility drawbacks. For these reasons a central registry of cultural property has been more or less an implicit request

[65] P. Singh, S. Singh, op. cit., p. 261.

[66] Ibidem.

[67] For example, is consultation mandatory for all transactions or only for transactions exceeding a certain price?

[68] The lack of standardization or regulation of provenance in the art market, and especially the lack of accepted consensus surrounding the type of documentation and the nature of the evidence that buyers and sellers will accept as proof of ownership history, can easily lead to the falsification of provenance records. See K. Orenstein, *Risking Criminal Liability in Cultural Property Transactions*, "North Carolina Journal of International Law" 2020, Vol. 45(2), pp. 529, 536-537; J.A. Levine, op. cit., p. 229.

[69] The cost of provenance research can be significantly higher regarding looted antiquities, where the illicit provenance has been "laundered" by international criminal antiquity traffickers. See T. Moskowitz, op. cit., p. 204.

[70] Moreover, thefts are underreported not only because there is no such obligation on the part of the victims, but also for fear that reporting them could actually lead to more thefts or have an impact on the museum's or institution's reputation. See K.F. Harris, *Seeking an Equitable Standard for Transactions in the International Antiquities Trade: A Critique of the 1995 UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects*, "U.C. Davis Journal of International Law & Policy" 2020, Vol. 27(1), p. 32.

in international law,[71] since international conventions insist not only on national inventories,[72] but also on an international registry for cultural property in need of special protection[73] and on the sharing or the interconnecting of national inventories or databases on cultural property.[74] Such a central database could and should be based on blockchain technology,[75] with a view to overcoming the hurdles of the existing system.

Blockchain as a central registry granting universal access

Blockchain technology as a technology management information system with so many possibilities seems to be ideal for the field of cultural goods, operating as a central registry that could contribute to ensuring the fulfilment of the due diligence requirement by supporting both mandatory consultation by the purchaser and reporting by the victim of theft. It could operate as a database where information related to ownership or provenance and transactions related to cultural goods is inserted, a technology that could certify and locate the object of a transaction at any time and which may permit the automatic execution of transactions.

Such a registry should ideally record all known cultural goods. This would mean that cultural goods not on the registry could be assumed illegally excavated or otherwise obtained. However, considering that this would be a very difficult, if not impossible endeavour, the inclusion of at least the stolen ones seems realistic and feasible. In any case, such a registry could contribute to the harmonization of due diligence requirements, since it would be easier for national legislation to include its consultation among the criteria for due diligence, given its global and central character.

[71] Such a request was implicit, mainly because at the time when cultural property law emerged the creation of a central registry was technologically impossible. See H.R. Cohen, *Modern(izing) Art: The Need for a Centralized Registry*, "Southwestern Journal of International Law" 2020, Vol. 26(2), p. 363.

[72] Indeed, Article 5 of the 1970 UNESCO Convention expressly requests that Parties maintain national inventories, whereas the Preamble of the 1995 UNIDROIT Convention provides for the development and use of national registers as an effective measure for protecting cultural objects that should accompany the implementation of the Convention.

[73] Such a registry is provided for by Article 8(6) of the 1954 Convention for the Protection of Cultural Property in the Event of Armed Conflict (14 May 1954, 249 UNTS 240) with regards to movable cultural property of very great importance.

[74] According to the Preamble of the 1995 UNIDROIT Convention, the sharing of information on national registries was intended by the drafters to be a means to better document and protect cultural property. Article 21b of the 2017 Council of Europe Convention on Offences relating to Cultural Property (CETS No. 221) provides for the sharing or interconnecting of national inventories or databases on cultural property that has been the subject of an offence defined in this Convention.

[75] For more on the idea of blockchain replacing some of the art registries held nationally, see G. Goffaux Callebaut, A. Barbet-Massin, *Blockchain et marché de l'art*, in: *La Blockchain*, Dalloz, Paris 2020, p. 160.

The main issue, however, in the application of the blockchain technology in the cultural field is which type of blockchain is appropriate. Should it be public, private, or hybrid?

The problem with the public blockchain, as explained above, is that it is immutable: the blocks are written in stone and it is very difficult to change them. This creates severe issues, as false information cannot be corrected.

Let's suppose that one wants to be registered in the system as the owner of a cultural good. For example, in our case <Galatea wants to be registered in the system as the owner of an amphora>. The crucial questions that arise here are: Who is entitled to examine the validity of the statement (i.e. that Galatea is the owner of the amphora); and what happens if the information is false? For a reliable due diligent system, we need an entity who is entitled to control/check if this information (i.e. that <Galatea is the owner of the amphora>) is indeed correct, and in case false information has been inserted to be able to correct it.

In the public, decentralized, blockchain validation of the information is made by participating nodes, the miners; but the accuracy of this type of information cannot be confirmed by them by simply resolving a mathematical problem. Once the information is validated and introduced into the system, it cannot be changed, even if it proves to be inaccurate. The validation in decentralized blockchains leads to "a permanent record which will be at best misleading and at worst exploitable by those seeking to launder illicit antiquities or pass fakes into the market".[76]

The problem of accuracy of data in blockchain ledgers made headlines in mid-2018 when a man named Terence Eden was able to place an entry into the Verisart ledger certifying himself as the owner and creator of Leonardo's *Mona Lisa*, with Verisart issuing a certificate.[77]

Apart from this, one should also consider that in decentralized systems, miners participate in the process based on a reward mechanism. If no reward is foreseen, participants would probably not proceed to the validation of the data. In our hypothetical case, the purpose is only to keep a registry indicating ownership, location, and traceability of the cultural asset, a goal that has no specific or direct financial value – thus it is questionable if a reward to the successful miners could be foreseen for their work.

Based on these assumptions, it seems that in the domain of illegal trafficking of cultural assets, it is more appropriate to select a private system where the access into the system is supervised and the validation is made by the controlling

[76] N. Brodie et al., op. cit., p. 266.

[77] Verisart issued a certificate saying that Eden's association with the work was "irrevocably sealed and permanently verifiable". He was not asked to provide any proof of ownership or proof of having created the piece, and was only asked to provide an email address and an image of the artwork (which he had downloaded from Wikipedia); T. Eden, *How I Became Leonardo da Vinci on the Blockchain*, 2018, https://shkspr.mobi/blog/2018/06/how-i-became-leonardo-da-vinci-on-the-blockchain [accessed: 16.05.2023].

entity; or a hybrid type of blockchain such as one that is controlled by an entity but permits access to the public to the information included in the registry. A private consortium or hybrid system seems more appropriate since it permits correction of the blocks in case false or inaccurate information has been inserted into the system.

Considering the nature of cultural goods, the entity that seems most appropriate to verify or reject the ownership status or provenance of an asset included in the ledger is UNESCO, since it is the agency that has been expressly designated in the 1954 Hague Convention as the one to assist State Parties in creating a technology to protect art and cultural property.[78] In the case of blockchain, such a technology will also enhance the protection against illicit trafficking afforded by criminal law.

The Impact of Blockchain on Criminal Law

Since databases and inventories for antiquities or cultural objects are frequently used in the context of criminal investigations,[79] a blockchain technology which would replace them is bound to have the same use. In fact, information on the identification and description of cultural goods contained in the existing databases allows for more effective criminal investigations and better chances for convictions, since the description in the database will provide the necessary evidence in this regard. A centralized database of all cultural goods – or at least stolen ones – on a blockchain will have the same utility, but enhanced.

This could be the case for both a cultural item with no record at all, or one signalled as stolen on the blockchain which is proposed for sale. The absence of registration in the blockchain or signalling of the relevant loss would constitute evidence of *mens rea* in the handling of property obtained by crime,[80] as would the recording of an illegitimate transaction on the blockchain.[81] Therefore, checking

[78] Article 23 of the Convention.

[79] Databases of stolen art have been in widespread use since the 1990s for the purposes of information exchange between law enforcement authorities. See S.J. Doulas, M. Hayes, *Access to Loss: Copyleft and the Protection of Visual Information*, "Art Antiquity and Law" 2016, Vol. 21(2), p. 103.

[80] An intentional offence in the majority of legal systems with respect to the handling of property obtained by crime requires knowledge of the illicit provenance of the property in question. See, for instance, Art. 321-1 of the French Criminal Code; Art. 394 of the Greek Criminal Code; Section 22 of the Theft Act 1968 (England and Wales); Section 17 of the Irish Criminal Justice (Theft and Fraud Offences) Act 2001; Section 259 of the German Criminal Code; Art. 505 of the Belgian Criminal Code; Art. 648 of the Italian Criminal Code.

[81] Although this would be a very rare occurrence, it should not be excluded altogether despite thorough controls and checks on the blockchain ledger. However, this would be beneficial for the law enforcement authorities since it will allow them to obtain more evidence by going up the chain of transactions on the blockchain. See T. Moskowitz, op. cit., pp. 223-227.

the blockchain ledger when acquiring a cultural good would become not only a good practice for the buyer, but also a standard of proof for the Prosecution authorities in their effort to prove the intentional element of offences related to the illicit trafficking of cultural goods, and especially the knowledge of their illicit provenance.[82] That being said, the accuracy of the description of the cultural goods in the blockchain and the chain of transactions, if any, will be of paramount importance in order to provide proof beyond doubt of such knowledge, thus facilitating police investigations into illicit trafficking cases.[83] The centralized nature of such a database will make it easier for courts to accept this link between insufficient due diligence and criminal liability, since its "mandatory" consultation prior to any transaction would not be considered disproportionate for the implicated parties, who will have to check only one database: the blockchain.

Of course, the success of the use of blockchain in this field will depend on the quality of the input information, since the more accurate the description of a cultural good is, the easier it would be to identify the real world item; as well as on the exhaustiveness of the blockchain database, which should contain at least all stolen or lost items, in order to significantly assist law enforcement and judicial authorities in the fight against illicit trafficking of cultural property. Last but not least, the security of the blockchain information is of paramount importance in order to guarantee the integrity of its information, which would be used as evidence in the criminal trial in cases relating to illicit trafficking.[84] In principle, a blockchain database offers higher standards of integrity and security than on-line databases, which can more easily be hacked or corrupted, and in addition will definitely lack the exhaustive character of a central registry. Therefore, the opacity of the antiquities market will cease to be an effective defence for criminals.

Indeed, in a market whose traditional secrecy is a real impediment to obtaining evidence regarding the extent of knowledge of the accused,[85] the use of blockchain appears as a complete change of paradigm. Examples from real-life cases (outlined below) could highlight this point and contribute to the added value that such a blockchain would have in criminal investigations in the field of illicit

[82] *De jure*, blockchain consultation will be regarded the same as any evidence that is brought forward in a court of law by the police, but *de facto*, it will be a significant proof of the existence of lack of property rights and of the relevant knowledge of those involved in antiquities transactions.

[83] Regarding the difficulties in terms of evidence in this area of criminality, see K. Orenstein, op. cit., pp. 534-536; R. Meagher, *A Kimberley Process for Conflict Antiquities: Determining the Viability of a Cultural Property Certification Scheme*, "New Zealand Journal of Public and International Law" 2019, Vol. 17(2), pp. 227-229.

[84] The integrity of evidence aspect is common in the field of scientific or technological evidence.

[85] J. Ulph, *The Impact of the Criminal Law and Money Laundering Measures upon the Illicit Trade in Art and Antiquities*, "Art Antiquity and Law" 2011, Vol. 16(1), p. 40.

trafficking of cultural goods. The first case[86] involved neo-Assyrian gold earrings, estimated to be over 3,000 years old, which were on sale by Christie's in New York. Despite the lack of any suspicion about their provenance, they turned out to have disappeared from Iraq after the first Gulf War in 1991. The establishment of their provenance led to their withdrawal from the auction and their return to the Iraqi authorities in 2010. In the second case,[87] the Metropolitan Museum of Art was forced to return, in February 2019, a golden coffin from the first century BCE, purchased from an art dealer in Paris in 2017 for €3.5 million. It appeared that the coffin was likely looted from Egypt during the unrest there in 2011, and that the Museum purchased it because it was accompanied by a forged 1971 Egyptian export license.

Taking into account the possibilities offered by blockchain technology, as described above, we can legitimately argue that in both cases a centralized blockchain database would have either prevented these acquisitions and/or secured convictions for those responsible for such acquisitions. Indeed, had these items been registered in such a centralized blockchain database, the fact they were signalled as missing or the disruption of transactions for a long period of time would have facilitated provenance research prior to their acquisition, by raising suspicion about their legal status. Moreover, during the criminal investigation phase, which would have followed the discovery of the lack of ownership on behalf of the seller, evidence related to the criminal liability of the sellers, or even the buyers, would have been easy to establish by the mere fact of registration of the relevant information in the blockchain.

Thus, we can argue that the impact of blockchain technology in the criminal law aspects of illicit trade in antiquities would be of twofold importance. On the one hand, insofar as regards prevention blockchain could act as a deterrent for any transaction with regards to cultural goods that are either not in the blockchain or have been signalled as stolen or missing in the blockchain. Actually, cultural goods falling into one of these two cases become *de facto* items out of commerce. On the other hand, insofar as concerns repression blockchain could facilitate prosecution and convictions for relevant crimes – such as theft and the handling of stolen property – by providing proper criminal evidence.

86 Ibidem, pp. 40-41.

87 D. Fincham, op. cit., pp. 606-607.

Conclusions

The use of blockchain technology in the antiquities market is not as disruptive as the appearance of blockchain has sometimes been deemed to be.[88] Undoubtedly, blockchain in this field would not only be used in its less innovative form, i.e., a private blockchain, but it would also be applied on an existing foundation, regardless of its disparity. Therefore, instead of a revolution, blockchain would be more of an improvement of existing technology, even though it will definitely inherit some of its flaws.[89]

However, its success in improving the flaws of the antiquities market is not self-evident based on the technology used, but will largely depend on the investment in terms of resources, expertise, and stakeholders' participation. The latter would most likely be conditioned upon respect for the need for this market's specific privacy requirements, as well as upon security guarantees. The compromises that would have to be made will determine the limits of blockchain's utility. Such limits would also be based on the technology itself and would definitely concern the question of the scalability of the blockchain.[90] Given that the larger the blockchain is, the greater its requirements are in terms of storage, bandwidth, and computational power, the inclusiveness of a centralized blockchain for the entire art market with regards to both items registered and users participating would surely put such technology to the test in the years to come.

References

Baudier P. et al., *Peace Engineering: The Contribution of Blockchain Systems to the E-voting Process*, "Technological Forecasting and Social Change" 2021, Vol. 162.

Bianco P., *Blockchain as a Technology Applied to Authenticity Issues: A Possible New Resource for Building up a Catalogue Raisonne?*, "Art Antiquity and Law" 2020, Vol. 25(4).

Brodie N. et al., *Illicit Trade in Cultural Goods in Europe: Characteristics, Criminal Justice Responses and an Analysis of the Applicability of Technologies in the Combat Against the Trade*, Publications Office of the European Union, Luxembourg 2019.

[88] Disruptive technologies entail the idea of break, rupture, or even total change with regards to the state of things. When it first appeared blockchain was thought as the tool that would revolutionize the market. Nevertheless, despite its unprecedented innovations, this was not the case. See P. Bianco, *Blockchain as a Technology Applied to Authenticity Issues: A Possible New Resource for Building up a Catalogue Raisonne?*, "Art Antiquity and Law" 2020, Vol. 25(4), pp. 308-309.

[89] As is the case with existing inventories, unknown looted or stolen cultural goods could not be registered on the blockchain. If the central blockchain is limited only to this category of cultural goods, this would mean that the unknown items which have not been previously registered could pass under the radar. See N. Brodie et al., op. cit., pp. 266-267.

[90] Blockchain scalability refers to the ability of the blockchain to process and store large numbers of transactions that are constantly increasing as additional users are added to the network. For proposed solutions concerning scalability issues, see P. De Filippi, A. Wright, *Blockchain and the Law*, Harvard University Press, Cambridge, MA 2018, pp. 56-57.

Brodie N., *Uncovering the Antiquities Market*, in: R. Skeates et al. (eds.), *The Oxford Handbook of Public Archaeology*, Oxford University Press, Oxford 2012.

Bursztynsky J., *Feds Seize $3.6 Billion in Bitcoin Stolen from Bitfinex Hack*, "CNBC", 8 February 2022, https://www.cnbc.com/2022/02/08/feds-seize-3point6-billion-stolen-from-bitfinex-hack.html [accessed: 14.05.2023].

Casertano L., *Combatting the Illicit Trafficking of Cultural Property: The Multifaceted Response to a Complex Challenge*, "Global Jurist" 2020, Vol. 20(1).

Cohen H.R., *Modern(izing) Art: The Need for a Centralized Registry*, "Southwestern Journal of International Law" 2020, Vol. 26(2).

Convention for the Protection of Cultural Property in the Event of Armed Conflict, 14 May 1954, 249 UNTS 240.

Cornu M., *Recasting Restitution: Interactions between EU and International Law*, "Uniform Law Review" 2015, Vol. 20(4).

Council of Europe Convention on Offences relating to Cultural Property, 3 May 2017, CETS No. 221.

De Filippi P., Wright A., *Blockchain and the Law*, Harvard University Press, Cambridge, MA 2018.

Derek F., *Towards a Rigorous Standard for the Good Faith Acquisition of Antiquities*, "Syracuse Journal of International Law and Commerce" 2010, Vol. 37(2).

Directive 2014/60/EU of the European Parliament and of the Council of 15 May 2014 on the return of cultural objects unlawfully removed from the territory of a Member State and amending Regulation (EU) No 1024/2012 (Recast), OJ L 159, 28.05.2014, p. 1.

Doulas S.J., Hayes M., *Access to Loss: Copyleft and the Protection of Visual Information*, "Art Antiquity and Law" 2016, Vol. 21(2).

Eden T., *How I Became Leonardo da Vinci on the Blockchain*, 2018, https://shkspr.mobi/blog/2018/06/how-i-became-leonardo-da-vinci-on-the-blockchain [accessed: 16.05.2023].

European Banking Authority, *Report with Advice for the European Commission on Crypto-assets*, 9 January 2019, https://www.eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493daa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf [accessed: 14.05.2023].

European Commission, *Distributed Ledger Technologies (DLTs) and Blockchains*, 18 March 2020, https://knowledge4policy.ec.europa.eu/foresight/topic/accelerating-technological-change-hyperconnectivity/blockchain-cryptocurrency_en [accessed: 14.05.2023].

European Commission, *European Blockchain Services Infrastructure: Newsflash*, https://ec.europa.eu/newsroom/cef/newsletter-archives/35323 [accessed: 14.05.2023].

European Insurance and Occupational Pensions Authority, *Discussion Paper on Blockchain and Smart Contracts in Insurance*, 2021, https://www.eiopa.europa.eu/system/files/2021-04/eiopa-discussion-paper-on-blockchain-29-04-2021.pdf [accessed: 14.05.2023].

European Law Institute, *ELI Principles on Blockchain Technology, Smart Contracts and Consumer Protection*, 2023, https://www.europeanlawinstitute.eu/fileadmin/user_upload/p_eli/Publications/ELI_Principles_on_Blockchain_Technology__Smart_Contracts_and_Consumer_Protection.pdf [accessed: 14.05.2023].

European Parliament, *Intellectual Property Rights and Distributed Ledger Technology with a Focus on Art NFTs and Tokenized Art*, October 2022, https://www.europarl.europa.eu/RegData/etudes/STUD/2022/737709/IPOL_STU(2022)737709_EN.pdf [accessed: 14.05.2023].

European Parliamentary Research Service, *Blockchain and the General Data Protection Regulation: Can Distributed Ledgers Be Squared with European Data Protection Law?*, July 2019, https://www.europarl.europa.eu/RegData/etudes/STUD/2019/634445/EPRS_STU(2019)634445_EN.pdf [accessed: 14.05.2023].

European Parliamentary Research Service, *Blockchain for Supply Chains and International Trade: Report on Key Features, Impacts and Policy Options*, May 2020, https://www.europarl.europa.eu/RegData/etudes/STUD/2020/641544/EPRS_STU(2020)641544_EN.pdf [accessed: 14.05.2023].

European Union Intellectual Property Office, *EUIPO Connects to TMview and DesignView through Blockchain*, 27 April 2021, https://euipo.europa.eu/ohimportal/en/-/news/euipo-connects-to-tmview-and-designview-through-blockchain?TSPD_101_R0=089375ec4aab20005991aadc25bddd773b3fe4ee7e005c416d1627f2f2fe27f9a4d94cf90e3096bb0809735b32143000014b779a1ee4a9cc4526e1c200aa649d8238aeb078f04b6ac9fc1bf7bc739df4a5695d2b61602220dc6e121f8554c45e [accessed: 14.05.2023].

Fincham D., *Assessing the Viability of Blockchain to Impact the Antiquities Trade*, "Cardozo Arts & Entertainment Law Journal" 2019, Vol. 37(3).

Francioni F., *Cultural Property in International Law*, in: M. Graziadei, L. Smith (eds.), *Comparative Property Law*, Edward Elgar Publishing, Cheltenham 2017.

Frigo M., *The Implementation of Directive 2014/60/EU and the Problems of the Compliance of Italian Legislation with International and EU Law*, "Santander Art and Culture Law Review" 2016, Vol. 2(2).

Fulli G. et al., *Blockchain Solutions for the Energy Transition: Experimental Evidence and Policy Recommendations*, Publications Office of the European Union, Luxembourg 2022.

Garcia-Teruel R.M., *Legal Challenges and Opportunities of Blockchain Technology in the Real Estate Sector*, "Journal of Property, Planning and Environmental Law" 2020, Vol. 12(2).

Gemmell O., *Is Good Faith Leaving a Bad Taste? The Role of Good Faith in the Transfer of Corporeal Property in Scots Law*, "Edinburgh Student Law Review" 2021, Vol. 4(2).

Goffaux Callebaut G., Barbet-Massin A., *Blockchain et marché de l'art*, in: *La Blockchain*, Dalloz, Paris 2020.

Harris K.F., *Seeking an Equitable Standard for Transactions in the International Antiquities Trade: A Critique of the 1995 UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects*, "U.C. Davis Journal of International Law & Policy" 2020, Vol. 27(1).

Hill K., *The Problem of Auction Houses and Illicit Antiquities: A Call for a Holistic Solution*, "Texas International Law Journal" 2016, Vol. 51(3).

ICOM International Observatory on Illicit Traffic in Cultural Goods, *What Is Illicit Traffic?*, https://www.obs-traffic.museum/what-illicit-traffic [accessed: 14.05.2023].

ICOM, *Code of Ethics for Museums*, 2017, https://icom.museum/wp-content/uploads/2018/07/ICOM-code-En-web.pdf [accessed: 14.05.2023].

International Association of Dealers in Ancient Art, *Code of Ethics and Practice*, https://iadaa.org/about-us/ [accessed: 14.05.2023].

Kassen M., *Blockchain and E-government Innovation: Automation of Public Information Processes*, "Information Systems" 2022, Vol. 103.

Kokotsaki E. et al., *The Application of Blockchain Technology in Copyright Field: Formalities and "Smart Contracts"*, in: *12th International Conference on Information, Intelligence, Systems & Applications (IISA)*, 2021.

Konashevych O., *Constraints and Benefits of the Blockchain Use for Real Estate and Property Rights*, "Journal of Property, Planning and Environmental Law" 2020, Vol. 12(2).

Lambert G., *Blanchiment et marché de l'art: le droit et la pratique*, L'Harmattan, Paris 2020.

Legeais D., *BLOCKCHAIN*, "Jurisclasseur", Fasc. 534.

Levine J.A., *The Importance of Provenance Documentation in the Market for Ancient Art and Artifacts: The Future of the Market May Depend on Documenting the Past*, "DePaul Journal of Art, Technology & Intellectual Property Law" 2009, Vol. 19(2).

Magri G., *The Impact of the UNESCO and UNIDROIT Conventions and the EU Directives on the International Art Market: An Analysis Fifty Years after the Introduction of the Obligation to Return Stolen or Illegally Exported Cultural Goods*, "Brazilian Journal of International Law" 2020, Vol. 17(3).

Meagher R., *A Kimberley Process for Conflict Antiquities: Determining the Viability of a Cultural Property Certification Scheme*, "New Zealand Journal of Public and International Law" 2019, Vol. 17(2).

Moskowitz T., *The Illicit Antiquities Trade as a Funding Source for Terrorism: Is Blockchain the Solution?*, "Cardozo Arts & Entertainment Law Journal" 2019, Vol. 37(1).

Nakamoto S., *Bitcoin: A Peer-to-Peer Electronic Cash System*, https://bitcoin.org/bitcoin.pdf [accessed: 14.05.2023].

Neuhaus N.M., Balay S., *Databases on Lost and Stolen Art: Is Consulting a Database an Inherent Requirement of Good Faith?*, "Art Antiquity and Law" 2014, Vol. 19(2).

Orenstein K., *Risking Criminal Liability in Cultural Property Transactions*, "North Carolina Journal of International Law" 2020, Vol. 45(2).

Rose C., *The Transfer of Property Rights by Theft: An Economic Analysis*, "European Journal of Law and Economics" 2010, Vol. 30(3).

Schrepel T., *Smart Contracts and the Digital Single Market Through the Lens of a "Law + Technology" Approach*, Publications Office of the European Union, Luxembourg 2021.

Simmons & Simmons LLP, *Blockchain – Le droit et la technologie blockchain: une approche sectorielle*, "Contrats Concurrence Consommation" 2017, Vol. 10.

Singh P., Singh S., *An Affair of the Art: Contemporary Reflections on the Legal Dimensions of International Art Theft*, "Art Antiquity and Law" 2019, Vol. 24(3).

Stoyanov D., *The Conflict between the Legal Interests of the Original Owner and the Good Faith Acquirer of Movables: A Comparative Overview of the Solutions*, "Lex ET Scientia International Journal" 2015, Vol. 22(1).

Swiss Association of Dealers in Antiques and Art, *Ethikcode*, http://www.vsak.org/Ethikcode.pdf [accessed: 14.05.2023].

The European Union Blockchain Observatory and Forum, *Blockchain Applications in the Healthcare Sector*, 2022, https://www.eublockchainforum.eu/sites/default/files/reports/eubof_healthcare_2022_FINAL_pdf.pdf [accessed: 14.05.2023].

Tucker R.L., *Stolen Art, Looted Antiquities, and the Insurable Interest Requirement*, "Quinnipiac Law Review" 2011, Vol. 29.

Ulph J., *The Impact of the Criminal Law and Money Laundering Measures upon the Illicit Trade in Art and Antiquities*, "Art Antiquity and Law" 2011, Vol. 16(1).

UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property, 14 November 1970, 823 UNTS 231.

UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects, 24 June 1995, 2421 UNTS 457.

Willett H.D., *Ill-Gotten Gains: A Response to the Islamic State's Profits from the Illicit Antiquities Market*, "Arizona Law Review" 2016, Vol. 58(3).