Empowering the Visual Arts via Blockchain Remix Innovations

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Abstract

This panel contributes new scholarly research to current debates on intellectual property rights infringement in the digital sphere where visual art is created, bought, sold, and traded. Artists, scientists, technologists, policymakers, and scholars remain concerned about fakes, imitations, and the lack of trust and transparency in such global transactions. Through ongoing Australian Research Council Linkage Project work (LP210300009) – conducted in association with partnering change-makers Australian Copyright Council, Copyright Agency, National Association for the Visual Arts, Australian Network for Art & Technology, and Commonwealth Scientific and Industrial Research Organisation (CSIRO) Data61, this panel shows how a range of digital artwork can be listed, securely traded, preserved, and remixed in previously unrecognized ways. Preliminary innovative blockchain solutions of the nature explored by the project team aim to authenticate, safeguard, and promote the work and livelihoods of creative industry practitioners and enterprises in cyber-secure ways. The hope is to challenge the rapid rise of fraud and unethical Artificial Intelligence-generated content in the wider copyright industries while encouraging the authorized remix of formerly inaccessible and future creative work.

Keywords

Blockchain, NFT (non-fungible tokens), Artificial Intelligence (AI), remix, visual arts, digital assets, monetisation, intellectual property, cybersecurity, digital intermediation

Introduction

Australia's visual arts sector and the nation's wider copyright industries, which contribute over $124 billion to the national economy [1], face increasing threats from the mismanagement and infringement of digital Intellectual Property (IP) rights. To assist with the reversal of this plight, this panel investigates the provision of a blockchain-based digital publishing solution for improving the protection of IP and provenance of visual art, and empowering its future economic, cultural, and social value and benefits. By exploring innovative blockchain opportunities in a global and cyber security context, we introduce and explain our user-friendly and compliance-checking non-fungible token (NFT) solution for expanding the creation, sale and distribution, valuation, and jurisdictional liability of ephemeral and digital art on existing virtual galleries and smart contract-enabled platforms. Building on interdisciplinary synergies between creative practice, IT, and collaboration with industry partners, the panel also interrogates the efficacy, risks and regulatory environment surrounding this technology, while sharing vital new knowledge for enhancing local and national engagement with this global development. We believe this is an important opportunity to future-proof creative industry developments in the rapidly changing digital economy.

Specifically, this panel explores how new and unforeseen bridges between ephemeral art, culture, intellectual property, technology, and decentralised finance are impacting on practitioners, enterprises, and digital/virtual activities in the creative industries. It introduces specifications for a new user-friendly Australian platform prototype that can ethically inform and host a range of NFT-minted art, digital content, and events. In technical terms, we offer a foundational blockchain-enabled architecture and open source cloud service for supporting customised NFT-minting solutions via a platform prototype, in which embedded smart contracts can enable users to monetise and track the provenance of digital assets in a tailored, transparent, and regulatory-compliant workflow environment.

The proposed platform adopts an autonomous intelligent approach to track and manage the movement of a digital asset and its provenance. While this approach may help to solve inconsistencies and trust issues that occur when digitising creative artefacts and integrating the conventional production and distribution workflows of various art communities, blockchain smart contracts have yet to prove their full efficacy and power in the offline world. When paired with robust existing national IP and copyright protection frameworks and processes, blockchain-enabled smart contracts do have the potential to help artists, appraisers, and buyers to track ownership, communication records, and accounting transactions (e.g. payment rails, timestamping) for each minted artwork – in line with studies [2], [3], and our proven results [4]. Notwithstanding these utopian affordances, there are serious concerns and major questions about this technology and its applications, which this panel will interrogate in collaboration with our industry partners.

A Blockchain Solution

The blockchain architecture underlying our platform interface is based on proven and ethical co-design thinking principles [5],[6]. It integrates detailed industry research and partner feedback, linking a systematic approach to customised smart contract development. This is critical for maintaining integrity between physical and ephemeral creative artefacts, and digital assets and their newly associated decentralised transaction protocols, which are core elements of NFTs. Given the diversity and uncertainties of blockchain and NFT choices in the market, it is crucial for such a framework to provide an effective, ethical and transparent environment suitable for preserving and monetising 2D, 3D, and spatial artwork, various installations, and recordings of live/virtual performances/events across the visual arts sector. Consequently, this newly generated knowledge can inform communities, stakeholders, practitioners, curators, installers, registrars, conservators, administrators, sellers/buyers, and art lovers in painting, drawing, street art, graffiti, printmaking, photography, film/video, design, and craft, through to industrial, graphic and interior design, and others seeking to understand this complex aspect of the digital economy and its risks, opportunities, and governance issues.

At the heart of this initiative lies a potential solution for addressing major cyber security concerns, recommendations and visions expressed in the Australian government's 2019 Digital Transformation Agency Blockchain overview guide [7] and 2020 National Blockchain Roadmap [8] – for agencies to continue monitoring blockchain developments, and to seek new opportunities that may enhance future service delivery and affordances unlocked by this technology. The primary aim is to support different ways for artists and collectors to engage with NFTs, as well as how to detect and manage the risks and opportunities of engaging in this emergent space. In so doing, the panel will reconceptualise Australia's arts sector within the broader context of a global market and ecosystem for digital assets, which is now estimated at $2.8 trillion AUD. [9]

There are several benefits for scoping such an Australian-based blockchain platform. First, it facilitates advanced understanding of 'minting' NFT art and managing rights in the rapidly transforming digital economy. Second, it bolsters efforts to combat inauthentic and illegal reproductions, and the legal frameworks for ensuring an artwork's provenance and full economic, cultural, and social value – key parts of 'total value' [10],[11],[12]. Third, it contributes a solution for increasing IP protection and revenue streams from future sales, trades and distribution (i.e. movement), which are heavily dependent on collaboratively generated knowledge.

To shed light on the abovementioned challenges, this panel will offer practical knowledge and best practice guides for seeking informed NFT solutions for both physical/traditional and digital assets produced by creative practitioners and/or managed by a range of visual arts enterprises and stakeholders. In turn, this intelligence can be used to inform future digital production and distribution workflows, as well as policymaking decisions on how to best support the further innovation of the sector.

These outcomes are vital for understanding and expanding opportunities for visual artists and art organisations, and using the project team's datasets, PO support, and findings to uplift innovation – as part of the government's National Innovation and Science Agenda. The Commonwealth Scientific & Industrial Research Organisation (CSIRO) is Australia's preeminent government scientific and data research agency, and its Data61 arm is a world-renowned innovator at the forefront of the digital economy.

Research Gaps

Until now, Australians could only imagine how an Australian-based blockchain platform might be utilised across the visual arts and creative industries, including design, digital content, film, television, music, architecture, publishing, and software. Moreover, Australian and international content makers have long experienced IP infringement, plus limited trustworthy opportunities for reaching and engaging with global audiences and potential buyers.[13] These are core concerns for practitioners and leading national organisations such as National Association For The Visual Arts (NAVA), Australian Network For Art & Technology (ANAT), Copyright Agency, and Australian Copyright Council (ACC), which provide valuable resources for educating members and the public on issues affecting the digital and offline worlds.

The Australian art market is recognised as an emerging arena, with interests from collectors and lucrative investments from overseas. Yet, although Australian art has been exported to millions of buyers across the globe [14],[15],[16], the broader industry continues to experience major hurdles such as trustworthiness, provenance, counterfeiting and royalty fraud. [17], Such persistent violations of the Australian Copyright Act (1968) and other laws, costs and other barriers to enforcement, threaten the economic, cultural, and social value of the creative industries [18],[19]. Utopian claims that minting NFTs from existing physical and/or digitally native works will overcome these issues abound. However, NFT resale revenues, for example, relate to a royalty on the sale of the NFT, rather than the sale of its associated artwork (if there is one). Hence, there is an urgent need to scrutinise the regulation of NFT smart contracts and how they are used to embed payment of resale royalties, and to investigate related blockchain technology platform structures more broadly, as their regulatory implications have yet to keep up with platform affordances. [20],[21],[22]

Applying blockchain technology [23], e.g., Ethereum smart contracts, has been acknowledged as a stable foundation for tracing authenticity and exchanging reliable information and workflows. Herein, 'workflows' are defined as the detailed steps in a creative or IT engineering process, providing insights on how artefacts and data flow from ideation to completion. Yet, the authenticity of works associated with such transactions remains hard to prove. This is relevant when a collaborative business process involves participants who may have yet to develop mutual trust [24]. Adopting NFT technology, which is a data set that is immutably recorded in the blockchain database with a unique ID,

can make each digital creative asset unique and traceable during the artefact's entire history.However, it is the NFT itself that is unique rather than the asset associated with it. In theory, such cryptography solutions [25] can facilitate economic and cultural value, while enabling artists to engage with buyers via secure peer-to-peer transactions. The 'NFT market' is thus designed for trading tokenised assets or cryptographic hashes and any rights that belong to them – which might just be the right to display a licenced work, rather than a transfer of ownership of the work itself. As the 2021 Select Committee on Australia as a Technology & Financial Centre report states [26], this new digital and crypto-asset ecosystem, including decentralised autonomous organisations, is reducing dependency on intermediaries to complete and track such financial agreements – all while the sector continues to experience unprecedented growth.

However, our preliminary research finds that Australia's creative industries have yet to understand and ensure the full economic benefits, employment opportunities, and risks afforded by blockchain technology and its decentralised finance environment. Currently, NFT platforms such as OpenSea, Cargo, Async, Mintable and SuperRare are enabling artists and enterprises to tokenise physical and digital assets. In turn, NFT owners are using such platforms to buy/sell, auction, trade, transfer, and store their crypto assets – in whole, or in fractionalised parts, under divergent contractual conditions. Not all NFT platforms are created equal. Each has vastly different terms of use and fee structures. It is this unevenness that is confusing and potentially disadvantaging content makers. Thus, despite the proliferation of crypto art platforms, industry members and researchers have yet to innovate a robust Australian platform that caters in fair ways to the diverse visual arts sector.

Earlier research has made some progresses in blockchain-enabled workflows [27], and digital publishing platform innovation [28],[29],[30]. Nonetheless, adopting blockchain to fortify Australia's visual arts industry is not a silver bullet, and the efficiency of a one-size-fits-all solution is under question, as evidenced by several reports of failed blockchain projects, as well as broader social media entertainment platforms [31]. Furthermore, integrating existing non-blockchain and blockchain digital publishing platforms, such as Indiledger, FRESCO, Artory, YAIR, Verisart, and the Scarab Experiment, involves interoperability between tasks, people, and resources.

In sum, this panel is innovative in two ways: 1) it investigates new applications of blockchain-enabled digital publishing platforms urgently needed to protect and revitalise Australian-made artwork and design in international trade; and 2) it will provide the partner organisations with vital comparative information about digital and virtual display and distribution models, advanced monetisation strategies, and new tools for potentially managing the IP of creative works. These outcomes build upon findings of our published pilot studies on blockchain adoption in IT-based organisations [32],[33],[34], addressing a new major challenge: a lack of analysis of art workflows on digital publishing platforms, and tailored approaches for customising smart contract design for the visual arts community.

There is a critical need for developing approaches that enable the integration of conventional workflows and address the unique needs of various art communities with blockchain smart contracts, which can help artists, appraisers, and buyers to track all ownership and communication records, as well as accounting transactions for each minted artwork. Thus, our platform specifications will enable users to transform all types of analogue creative artefacts into this new space, and then codify the conditions associated with creating, distributing, and selling their NFT digital assets. Results from one of our previous studies [35] highlights the need for this type of early intervention in line with national and international IP protection laws and regulations, which are embedded in blockchain-enabled smart contracts.

Industry Benefits

This panel aligns with the visual arts sector's urgent need to understand the affordances of blockchain-enabled technologies, and the innovative opportunities and cyber security risks associated with NFT-minting and distributing crypto art. The panel will offer a range of stakeholders an opportunity to assemble strategic information on development, deployment, and monetisation models applied to tailored visual arts contexts, as well as the advocacy and education efforts that shape the innovation, longevity, and regulatory concerns in our field.

As such, this unique interdisciplinary panel will exhibit innovations that interrogate blockchain smart contracts and their deep associated liability and regulatory impacts, with the collaborative practices of visual artists and the requirements of the Australian Copyright Act. It is aligned with CSIRO Data61's world-renowned work in blockchain tech, and consistent with the rapid adoption of blockchain projects in the EU. [36] This project's detailed specs for a new integrated and tamper-resistant blockchain digital publishing platform – locally tailorable, for auto-conformance checking and protecting IP, will advance industry contributions to the digital economy over time.

For Australian industry bodies and creative practitioners, this timely panel will create bridges between ephemeral art, culture, IP, technology, and decentralised finance – all key aspects of Australia's digital economy, which is estimated to add AU$140 billion to our GDP by 2025 [37]. Practitioners and enterprises that engage with local and global audiences will potentially benefit from the comparative data generated by this project, as they incorporate this new knowledge into their creative practices, decision-making processes, and collaborations with international partners.

It is hoped the tangible and customised solutions addressed by the panel will contribute to the increased ownership protection and visibility of provenance, as well as the potential for greater sustainability, efficiency, and profitability of visual art. These are core elements of 'total value', and they meet the guidance and cyber security suggestions found in the Australian government's 2019 Digital Transformation Agency Blockchain overview guide, 2020

National Blockchain Roadmap, and 2021 Select Committee on Australia as a Technology & Financial Centre report, which encourage enterprises to monitor blockchain developments, and to seek opportunities for enhancing future service delivery and affordances unlocked by this technology.

Policy makers who shape creative content and decentralised finance regulations will also benefit, as regular briefings will be available to input to any review processes or inquiries (subsequent to Blockchain Australia's policy and advocacy activities) that occur during the study period. Institutions involved in the education, training and curatorial activities of creative personnel will also find these briefings of value, alerting them to the opportunities and the potential that crypto art may offer for emerging practitioners to gain experience and to leverage their careers nationally and internationally.

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Authors Biographies

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Jo Law researches on the intersection of art, media, and technology, and she has experience in touring object-based electronic artworks to exhibitions overseas. As the Australian Council Tokyo artist-in-residence, she pioneered the delivery of artworks as online digital artefacts and lithographic prints. She and Agnieszka Golda have long standing collaborations together, delivering a live-cast for the Virtually MakerFaire 2020 as part of Making Futures Industries, where they employ longitudinal studies to gauge change.

Agnieszka Golda has expertise in the visual arts, exhibition curatorship, and working with museum collections. Her curatorial project, Ways to Water, brings together key artworks from Wollongong Art Gallery and UoW to highlight the evolving cultural relationships with coastal regions. It combines historical and contemporary artworks with indigenous artefacts, and a commissioned Augmented Reality work brings to life the multifaceted stories of NSW South Coast. As an artist, Golda has experience in touring object-based textile and installation works internationally.

Grant Ellmers has expertise in design education, reflective practice, and photography exhibitions. His interdisciplinary research on design workflows and practice-led approaches has created new knowledge for the study of co-design processes. He has skills in graphic user interface design and web and mobile app design.

Zeyang Ivy Zhou is a Senior Lecturer in Finance at the University of Wollongong. She researches on social media, derivatives markets, and emerging trends in financial technology, including digital currencies and asset tokenization. Her work is published in *Journal of Finance, Journal of Futures Markets* and *Journal of International Financial Markets,* etc., and she has presented her work to stock exchanges and regulatory bodies in Australia and Singapore.

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