DeCaDE (CityScreens NFT) Research Ethics Overview

Foreword (Chris Elsden)

This document is a summary of the Research Ethics audit
(https://uoe.sharepoint.com/sites/hss/eca/research-ke-impact/SitePages/Ethics.aspx) that
we have applied for and been granted by Edinburgh College of Art (ECA), for *A Token Gesture,*
as part of the DeCaDE research project.

This summary is derived from a form required by ECA, that is intended to help researchers
recognise any ethical risks in their research, and also to protect researchers, participants and
the university itself in case of any harms that may result from a research project.

We're sharing this as an exemplar of some of the challenges of doing ethical research with
decentralised technologies, and in the interests of transparency for all those who we work
with directly, as collaborators and as research participants. Finally, we understand that an
ethical approach to research is not simply written on a form, but should be practiced on a
daily basis in our actions as researchers. We welcome hearing from anyone about how our
approaches to ethical research can be improved and developed.

Project Details

DECaDE (https://decade.ac.uk/) is a 5-year National Research Centre exploring how emerging data technologies such as Distributed Ledger Technology (aka `Blockchain') and Artificial Intelligence (AI) could transform our digital economy through decentralized platforms.

In the Institute for Design Informatics, at Edinburgh, we are focused on the Decentralised Creative industries as a case area for value co-creation in the decentralised digital economy where a shift from centralised content distributors (broadcasters) to decentralised platforms promise radical new business models that redefine how value is derived from digital content.

This ethics application is for specific research project within DeCaDE – herein called CityScreensNFT. This project will engage research participants and members of the public in an experience to create a generative artwork, and produce 'mint' a 'non-fungible token' – more commonly abbreviated to NFT. They will do this via engagement with the InSpace 'City Screens' – formed of seven large visual projectors, which project out onto Crichton St, adjacent to the Bayes Centre. The aim of the project is to critically introduce and explore how NFTs can (or cannot) be used to produce new interactions, experiences and economies around digital artwork and user-generated content.

List of those involved in conducting research:

Prof. Chris Speed (Co-I); Dr. Chris Elsden (Co-I), Prof. Burkhard Schafer (Co-I), Dr. Evan Morgan (Research Software Engineer), Dr. Ella Tallyn (PDRA), Martin Disley (Developer / PDRA)

Dr. Dave Murray-Rust (Co-I, TU Delft)

Please provide a short synopsis on your project, and what this involves. Please provide some brief information on the interactions and methodologies planned with any active participants in the project.

The aim of this design-led project is to critically introduce and explore how NFTs can (or cannot) be used to produce new interactions, experiences and economies around digital artwork and user-generated content. NFTs are a form of digital assets, whose uniqueness and ownership can be demonstrated and verified using distributed ledger technology (DLT). (For an extensive description of how NFTs typically function, and their legal implications, see this introductory guide from Clifford Chance - https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2021/06/non-fungible-tokens-the-global-legal-impact.pdf)

NFTs gained widespread mainstream acclaim and appeal throughout 2021 – creating a new marketplace for digital artworks, and as a new form of speculative asset class. Based on blockchain technologies, such as the Ethereum network (https://ethereum.org/en/) , the

hype around NFTs has also drawn considerable criticism due to the unregulated, speculative and unstable nature of crypto-assets, the environmental costs of some blockchain networks, and projects which have attracted investment and then failed to deliver the promised benefits or return on investment. In addition, NFTs make a disruptive claim – that through ownership of a digital token, a form of receipt or certificate, one can 'own' a digital artwork, regardless of others abilities to copy, view or engage with this artwork, as is common for most digital images. This is without doubt a highly complex and contested context. However, for these reasons we believe it is crucial to conduct critically engaged and participatory research that exposes how NFTs actually work, what they do (and do not) offer, and provide a general audience the opportunity to experience and reflect upon these emerging technologies. At the Institute for Design Informatics we have a long history of working with non-experts and the general public to offer critical experiences of blockchain technologies.

The specific research aims of this applied project are as follows:

- To design, develop and prototype our own set of NFTs for a digital artwork
- To offer an opportunity for public engagement with NFTs
- To facilitate and study how members of the public are able to be setup and onboarded with a 'wallet', which holds cryptocurrency and is a necessity of any interactions with NFTs or other blockchain-based systems.
- To understand how audience experience and value 'minting' their own NFT, and the novel forms of 'ownership' this can (or cannot) offer.

To do this, we will facilitate a public, walk-up, interaction consisting of three parts:

1) Interacting with the InSpace CityScreens in-person to create a unique digital artwork.
2) 'Minting' and owning an NFT associated with this artwork. This token will bestow various rights regarding the artwork, but will not be 'transferable' (meaning it cannot be sold via third-party marketplaces, as most NFTs are). There will be no cost to any participant to create and manage their NFT as part of the research.
3) Facilitating future engagements with the artwork, via this token, including for example being able to decide when the artwork is shown, destroying the artwork, or exchanging the ownership of the token and/or artwork.

Each interaction with this system will be logged anonymously.

Alongside this deployment and user experience, we will conduct multiple forms of qualitative research, including interviews, surveys, observational studies, as well as collecting analytics data around the generation and use of the artworks and NFTs.

Do those named previously need appropriate training to enable them to conduct the proposed research safely and in accordance with the ethical principles set out by the College.

No.

Are researchers likely to be sent or go to any areas where their safety may be compromised?

No.

Could the research induce any psychological stress or discomfort?

No.

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

N/A

Could researchers have any conflicts of interest?

Yes.

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

NFTs are part of a wider set of distributed ledger technologies, that include crypto-currencies and decentralised finance applications, which are based on blockchain infrastructures, such as Bitcoin or Ethereum, among many others. The success or not of many of these technologies depends upon other users investing money into these technologies or currencies, with the expectation of continued growth of the network. Many interactions with these networks are hence premised upon financial incentives – in particular, that early-adopters will benefit from future adoption and use of a platform or currency.

There is a potential conflict of interest, or perception of conflict of interest, were the research we undertake leads to the growth of any particular currency, platform or asset from which the research team subsequently could financially benefit.

We will address these issues by:

- Ensuring none of the research team interacts (buys, or sells assets) with the Tezos blockchain personally for at least 6 months after the exhibition ends. To our knowledge, none of the research teams holds significant cryptocurrency assets at the current time (e.g. more than £1000).
- We will clearly explain that our choice to use the Tezos blockchain (https://tezos.com/), and a wallet for this deployment is not an endorsement of this particular infrastructure.

- The NFT we create will not be transferable, and hence owners will not be able to trade it on the blockchain. This will ensure the research team cannot benefit financially from the production of these tokens.

Will any part of the research involve audio, film or video recording of individuals?

Yes.

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

Recordings will be made both in the creation of artwork, and through qualitative research about the artwork and participant experience.

A participant will be able to create a unique piece of generative artwork by interacting with a street-facing camera. This camera simply detects when a consistent colour is presented in front of it, and then uses this as a seed to generate a new artwork. In practice, participants will create work by holding an object with a particular colour – e.g. an item of clothing – in front of the camera. Although the camera will be continuously focused on the street, it will not record any footage in doing so. It will only be used to detect a colour presented to it. Signage besides the camera will clearly explain that the camera is not recording video footage.

We will follow up with participants who have created an artwork to invite them to speak to us about their experiences for our research. We will use a combination of audio and video to record interviews with these participants, who will be asked to provide informed consent to participate in this research (via the information sheet and consent forms attached) and following the normal tenets of academic research.

Once collected, this data will be shared only within the DeCaDE research team, as necessary. It will be wholly anonymised before publication.

This data will be stored securely, and participants will also be able to request this data is deleted after their participation.

Does the research involve any physically invasive or potentially harmful procedures?

No

Will the research require collection of personal information from any persons without their direct consent?

No.

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

N/A

How will the confidentiality of data, including the identity of participants (whether specifically recruited for the research or not) be ensured?

The following steps will be taken to ensure the confidentiality of data:

1) Regarding engagement with the City Screens and creation of an NFT.
   a. Creating an NFT will only require an email address, used by the research team to provide instructions on how to set up wallet, and further information about the study.
   b. No further *personal data* is required to create an artwork and produce an NFT.
   c. Wallet addresses are anonymous – and not personally identifiable. However, any wallet interactions on a public blockchain are publicly visible. This is a fundamental part of the transparency of transactions that a blockchain depends upon.
   d. In practice, anyone can see the transactions a particular wallet engages in but they will not know who the wallet belongs to, and this wallet will not be connected to any other personal data – unless the participant chooses to do so themselves (for example by publicly sharing their wallet address, or linking it to online identities, such as a Twitter profile or email address). We will clearly inform participants about the visibility of wallet addresses and their transactions so they can take informed decisions about their use of this wallet.

2) Participation in Further Research / Data Collection
   o All research data will be collected with informed consent and additional permission will be sought for use of any images/film associated with the research which subsequently identifies participants.
   o Any observational data collected without direct consent will be fully anonymous from the point of collection.
   o Raw research data will be shared in with DeCaDE research team.
   o We will securely store consent forms and the raw data/

We will liaise further with the ethics committee at ECA if we anticipate or encounter any other unforeseen issues relating to confidentiality.

How and where will the data be stored, in what format, and for how long?

1) Regarding participants engagement with the CityScreens exhibition and creation of an NFT.

   a. Email addresses will stored on a secure database on UoE servers, accessible only to necessary members of the research team. They will be

stored for up to 5 years, encompassing the duration of the DeCaDE project.

b. Creating an NFT, and subsequent interactions with an NFT will require a cryptocurrency wallet, which functions as a browser extension. We are planning to use a third-party service (e.g. Temple - https://templewallet.com/) to create these wallets. Wallets are entirely decentralised, and will be created and managed independently by the participants themselves. Wallet addresses (which identify a specific wallet, similar to a bank account number) will never be associated with email addresses, or any other personally identifiable information. Participants will also, privately, manage their own 'keys' and passwords for their wallets. The research team (nor third-party 'Temple'), will never be able to access a participant's wallet. However, the research team will be able to send an NFT, and any other future token, to any wallet that has connected to the token contract underpinning the exhibition. All transactions between wallets are stored immutably on the Tezos blockchain. Wallets cannot be deleted – however, as they are only accessible via credentials only known by a participant, if these credentials are forgotten, or destroyed, the wallet, and any tokens within it, will be irretrievable.

2) Where participants engage in any further research, for example participating in a subsequent event, interview or survey. The data will be stored as follows:

Researchers will use encrypted computers issued by and belonging to the UoE, prepared to UoE standards, under the care of the researchers on the project

a. Raw data that is *in use* for data analysis (e.g. audio recordings, survey data, participant details) will primarily be stored on the UoE SharePoint and encrypted where it contains personally identifiable information, so that it can be shared with relevant members of the research team.

b. Following analysis, where active collaboration on files is not necessary, and data is not actively being used, the data will be stored until the end of the project on the UoE's DataStore rather than on SharePoint. DataStore is the recommended form of active data storage at the UoE, and is stored on university servers: https://www.ed.ac.uk/information-services/research-support/research-data-service/during/data-storage.

Further detail on how data will be stored beyond these principles will be detailed according to our data management plan, to be provided in due course.

Who will be entitled to have access to the raw data? Please provide names and positions.

Prof. Chris Speed (PI)

Dr. Chris Elsden (Co-I)

Dr. Evan Morgan (Research Software Engineer)

Martin Disley (Design Research Developer / PDRA)

Dr. Ella Tallyn (PDRA)

How will the data be disposed of?

Any physical data sources (e.g., paper data) containing personal data will be shredded and disposed of in confidential bins at the University. Digital data will be permanently deleted in conjunction with the Information Services department, for example through a service like DNAB for unencrypted files, or through destroying the decryption key for encrypted files.

Data written to a distributed ledger or blockchain is immutable, and cannot be deleted – this immutable record is a fundamental feature of the technology. The only data stored 'on-chain' will be the transactions between wallets and the 'token contract' which governs the creation and record of NFTs. This data will never be connected to personally identifiable research data. Only the participant themselves will be able to connect their personal identity to their wallet.

Similarly, the artwork created will be stored via a decentralized file system – IPFS - https://ipfs.io/ - the leading protocol for peer-to-peer file storage and the storage of images referenced by an NFT. As a decentralized system, it is not possible for the creator of an IPFS file to delete it (they can only delete the copy on their own device) – however the artwork may be removed from display in the exhibition itself.

To reiterate - no personally identifiable data will be stored on a blockchain. If a participant wishes to withdraw from the study we will delete all identifying records of their participation such that it will be impossible to know or prove who created the artwork and transactions associated with the wallet they used.

The project will run for up to 6 months.

At the end of the project we will prevent any further modifications from being made to the exhibition smart contract – leaving it on the blockchain in a fixed state.

What steps have been taken to ensure that only entitled persons will have access to the data?

Access to physical data storage, SharePoint access and DataStore access will all be managed through encryption and password protection. For example, all data containing identifiable information will be encrypted if used on cloud services, with

only entitled parties having access to the key. All individuals involved in the project will follow a data management plan in order to ensure proper sharing of data.

How will the results of the research be used?

The results of the research will be disseminated to other academics and the public through: research presentations at conferences, seminars and symposia; through research publications; and in public engagement venues, such as InSpace Gallery. Public engagement may include, for example, presentations to the public about the outcomes of the project, including educational, and critically reflective presentations about NFTs and blockchain technologies.

With their consent, we will also keep our pool of participants (anyone who provided an email address and created a wallet during the project) informed of further related studies and activities on these topics.

The results will also be shared with academics and research partners on the wider DeCaDE centre and funding agencies.

What feedback of findings will be given to participants?

All participants will be provided with the link to the CityScreensNFT website which will be the central place to share news and updates on the project and findings.

At the time of data collection, the participants will also be asked whether they want to provide their contact information in order to be informed of the findings of the research. If they answer yes, we will share links to research outputs where data from their participation is included. We will also provide them with feedback on how their participation has helped us shape the project, where relevant.

Publications that result from this research will be made available on PURE.

Is any information likely to be passed on to external companies or organisations in the course of the research?

No.

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

N/A

Will the project involve the transfer of personal data to countries outside the European Economic area?

No.

The research involves living human subjects specifically recruited for this research project.

Yes.

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

As detailed above, through our approach to informed consent, including the ability to withdraw data after the study, as well as our ethical and secure use of data.

What criteria will be used in deciding on inclusion/exclusion of participants?

We wish to engage as broad an audience as possible in this project. Inclusion in the study will simply be based on engagement of passers-by of the InSpace gallery on Crichton St, in Edinburgh.

We will advertise the exhibition broadly, including through social media channels, so some we hope some interested participants will make an intentional visit to the screens in person.

On occasions, we may also introduce the exhibition through approaching passers-by directly on the street adjacent to the exhibition, or holding events that advertise the exhibition.

Participation will rely on physically being in front of the screens. The primarily limitation will concern individual's ability to give informed consent.

When providing an email address, we will ask people to confirm their date of birth, confirming they are over 18 and able to provide informed consent to take part in the research.

How will the sample be recruited?

As above, participants will be recruited via on-street advertisement, and promotion of the exhibition via social media and mailing lists, including creative and cryptocurrency communities.

How many participants will be involved in the study?

The total number of participants will depend on the level of public engagement with the screens. At this point, we do not anticipate setting a limit on how many people will be able to create an artwork and mint an NFT.

We will aim to engage between 20-50 participants who created an artwork, in follow up research, such as an interview, attending a focus group, workshop, or completing a short survey.

Will there be a control group?

No.

Will the study involve groups or individuals who are in custody or care, such as students at school, self help groups, residents of nursing home?

No.

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

N/A

Participants have a right to withdraw from the study at any time. Please tick to confirm that participants will be advised of their rights.

I confirm that participants will be advised of their rights to withdraw from the study at any time.

What information will be provided to participants prior to their consent? (e.g. information leaflet, briefing session)

Engagement with CityScreensNFT will entail multiple stages of consent and information being provided sequentially, and as necessary to participate in the activity. Additionally, all of this information will be available in one place, via the project website, including a contact email address for any help requests. How best to provide such information in a clear and educational way is a fundamental objective of the research.

The invitation to create an artwork will inform participants that by engaging with the exhibit, a camera will record only a colour value, and use this to create a unique piece of digital art. The user will be able to create multiple artworks, without providing any personal information in this way. They will be informed and asked to consent to the system logging each interaction.

If they wish to preserve their artwork, and 'mint' it as an NFT, they will be required to provide an email address to receive more information about the project and this process. We will also provide an email address for them to contact the research team, should they have any questions, or wish to recant their participation.

Using this email address, we will send them instructions about how to claim an NFT related to their artwork, and further information about participating in the research, and how this NFT can be used. Participants will have to record consent via a dialogue on the project website to confirm their understanding of the implications of creating a cryptocurrency wallet, and the claiming their NFT. This consent will be recorded in our database, alongside an anonymous wallet address. At this point, we will ask the participant to confirm that we may also send additional messages to their wallet. This means we will be able to communicate with participants directly via email, and anonymously via their wallet.

Once participants have minted an NFT, we will provide additional instructions via email about how their token can be used (for example, to control the appearance of their artwork via the InSpace City Screens, or to view their artwork through the project website). In doing this, we will ensure to avoid any potential to link email addresses and wallet addresses.

Participants will be able to opt-out of these emails at any time. We will make it clear to participants when the study will end, and the future uses (and non-uses) of their NFT.

Participants who provide an email address will be contacted to be given opportunities to participate in further research, including, for example, a survey, interview, or additional research events or workshops. Participants will receive an information sheet outlining: the purposes of the specific study, risks associated with taking part, their rights (including the right to withdraw from the study at any time) and their rights over the personal data collected, in accordance with GDPR. If the information sheet is provided digitally, researchers' contact information will be provided, that the participants can use to ask clarifying questions in order to make an informed decision about whether to take part. If the information sheet is presented in person, the researcher will ask if the participants have any questions before agreeing to take part.

Our consent form will be provided to participants before the beginning of any study, and we will go through the form carefully with them in person or digitally, ensuring they are aware of options to opt out from specific parts of the research or data collection where this is possible. In addition, where a study takes place over a longer time period, we will seek additional consent via website dialogues at each further stage of participation and data collection. We will also make it clear in the information sheet how participants can opt-out even after they have participated in the research.

Templates of our information sheets and consent forms have been attached with this application.

Will it be necessary for participants to take part in the study without their knowledge and consent? (e.g. covert observation of people in non-public places)

Yes

Where consent is obtained, what steps will be taken to ensure that a written record is maintained?

Signed consent forms (either digital consent forms or scanned paper consent forms) will be stored on an encrypted, password protected hard drive, accessible only to the researchers and project team involved in the study. Until scanned, any paper consent forms will be stored in a locked cupboard on university premises, only accessible to the researchers and project team involved.

Additional consent obtained through website dialogues will be recorded and stored in the exhibition database.

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

At certain times, we may wish to collect data about how people interact with an exhibition or prototype in a non-public space like a gallery space or university building. Observations might include, for example, how many people approach an exhibition in a certain space of time, how long they stay, or what aspects of an exhibition people seem to interact with the most. In these instances of covert observation, all observations will be anonymous and non-identifiable. No video, audio or other personally identifiable data will be recorded of the participants. Clear signage will also be posted about what data is being collected, with details about how to raise any concerns.

Where the researcher wants to collect identifiable observation data, that does not meet the above criteria, the participant will be asked to give informed consent prior to data collection.

Will participants receive any financial or other benefit from their participation?

Yes.

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

By participating in the CityScreensNFT participants have the potential to gain several benefits. First, they will create an artwork, which may be publicly exhibited. Secondly, should they wish, they will be able to mint and own an NFT directly linked to their artwork. Ownership of this NFT will offer the participant various rights regarding how their artwork is shown, and the broader CItyScreensNFT exhibition.

Crucially, unlike other NFTs, their token will be designed to be non-transferable. This means it cannot be sold vias third-party marketplace (e.g. Objkt). This, and the undefined number of NFTs that will be minted should ensure that their NFT has no commercial value, and cannot be bought or sold in a speculative manner – as is the case with many other NFT projects.

Through ownership of an NFT, participants will have the opportunity to participate in further events related to the DeCaDE project, and digital art exhibitions at InSpace.

If participants choose to take part in follow-up research, for example a research interview, they will be compensated for their time via a shopping voucher relative to their engagement (e.g. £20 for a one hour, one-to-one interview, or for participation in a 2-hour workshop).

In the case of participants whose first language is not English, what arrangements are being made to ensure informed consent?

In general, the information sheets will be written in a clear language, accessible to the general UK population. The exhibition itself will be presented in a visually clear and compelling way, and may include illustrations or diagrams to explain more challenging concepts clearly.

If the participants have a high level of English, despite it not being their first language, they will be presented with a standard information sheet. We will check for their understanding, by giving them the opportunity to ask clarifying questions.

If it arises at the time of data collection that the participants do not understand the information sheet and/or their level of English is not sufficient to partake in the study, we will postpone data collection.

Are any of the participants likely to be particularly vulnerable, such as elderly or disabled people, adults with incapacity, your own students, members of ethnic minorities, or in a professional or client relationship with the researcher?

No

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

N/A

Will any of the participants be under 16 years of age?

No

Do the researchers named above need to be cleared through the Disclosure/Enhanced Disclosure procedures?

No

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

No

If you selected yes, please give details of how this issue is being / will be addressed to ensure that ethical standards are maintained.

N/A

Does your research concern groups which may be construed as terrorist or extremist?

No.

Is the research proposal subject to scrutiny by any external body concerned with ethical approval?

No.

Will any of the participants be interviewed in situations which will compromise their ability to give informed consent, such as in prison, residential care, or the care of the local authority?

No

In my view, the ethical issues listed below arise and the following steps are being taken to address them:

There are three potentially significant and unusual ethical issues arising through this research which we wish to address.

1) *Introducing non-expert participants to NFTs*

A central aim of our research is to study and educate, non-experts, in order to understand and report their experiences, views and needs regarding this rapidly emerging technology. It is important to acknowledge that NFTs, like many other blockchain-based technologies, are potentially controversial and problematic. As a decentralised, global technology, they are largely unregulated. They also rely heavily on jargon and poorly understood terminology. In addition, many public blockchain and NFT projects are explicitly economic, and rely upon the creation of speculative financial assets. There are numerous examples of cryptocurrency and NFT projects which are a

form of fraud, where early backers and supporters profit from recruiting new participants to a project before later withdrawing their support. Finally, due to the underlying protocols relying on competitive computer power, the technical infrastructure of many blockchain and NFT projects requires excessive computational power, resulting in very high energy demands and CO_2 emissions.

We therefore acknowledge a secondary risk that participants who participate in this research project become interested in a technology and topic which has known harms. We will address this risk directly by providing educational and critical commentary on blockchain-based technologies throughout their participation. Critical information will be provided as part of the exhibition where participants first interact with an NFT, in subsequent correspondence via email, via the project website, and in any further research engagements. We will ensure that at no point in our research do we promote or endorse any particular blockchain or project. At no point will participants be asked to invest any money in this research. In addition, our project will be explicitly non-commercial, meaning participants will not be directly exposed to speculative marketplaces for NFTs, cryptocurrency exchanges or other trading platforms. In addition, for any participant to pursue an interest in collecting NFTs or trading cryptocurrency would additionally require them to sign up to a cryptocurrency exchange, which includes further age and identity verification measures.

Our intention is that anyone who participates in the project will be much more informed about the risks of engaging with blockchain technologies than they would be otherwise. These technologies are already widely discussed through news channels and social media – although often without appropriate context or critical commentary around their use. Fundamentally, we believe that though often developed or promoted in problematic ways, these technologies cannot be ignored by academic research, and it is crucial to engage non-experts about their potential implications and uses.

We have chosen to develop this project through the Tezos blockchain specifically because it is a 'Proof of Stake' protocol, which is much less energy intensive than other "Proof of Work" platforms.

2) *Wallet Management and On-Chain Data*

As described above, this project will rely upon participants creating and managing their own cryptocurrency wallets, via a browser extension (e.g. https://templewallet.com/ or https://wallet.kukai.app/). Educating and observing how participants manage their wallets is a key objective of the research. As a decentralised technology, we cannot manage wallets on behalf of participants – though we can support them in an onboarding stage. As addressed above, cryptocurrency wallets present ethical and data management challenges because all of the transactions a wallet makes are recorded immutably, and publicly via a blockchain. This transparency is fundamental to the trust and functionality of a decentralised currency or token registry. Wallets addresses are anonymous unless they are connected with other personally identifiable information. We will never connect participant details with a wallet, however participants may themselves

choose to share their identity (pseudonymously, or otherwise) as the 'owner' of a particular wallet or artwork. In addition, participants could in theory use the same wallet for future transactions. Equally, if participants lose their credentials or 'keys' for their wallet (and have not safely recorded a seed phrase used to set up a wallet) then, due to the decentralised nature of the system, there is no way to retrieve their wallet, or any tokens or currency contained within it.

It is therefore vital that participants understand how to manage a cryptocurrency wallet safely and securely to ensure they are able to properly manage any assets or tokens they may have. Once again, understanding how non-expert participants manage wallets is a key objective of the research. We will support participants to manage wallets in the following specific ways:

- Providing very clear, jargon-free instructions on how to set up and manage a wallet via email and additional instruction videos. These will also be made available via the project website. We will ask participants to explicitly indicate their understanding and consent to the use of a cryptocurrency wallet.
- Frequently reminding participants of the implications of linking personally identifiable data to their wallet address (e.g. by sharing their wallet address via social media) and the transparency of all transactions.
- Providing additional links to information about the Temple Wallet specifically.

3) Decentralisation of assets related to the research project

A final more fundamental issue with research involving the use of public blockchains – such as this project – is that the project involves the creation of decentralised assets and tokens, where the research team have limited centralised control over what participants can and can't do with their assets. Once again, this potential for decentralised ownership is one of the fundamental qualities of NFTs that we aim to explore during this research project.

In this particular research project, the risks of this decentralisation are very limited, and primarily concern the inability to remove data about wallets, or to destroy artworks once they have been created. However, we will maintain a number of mechanisms to retain a degree of centralised control. These include:

- Not allowing token owners to transfer their tokens between wallets (and hence to be listed and sold via external marketplaces).
- As an administrator, we will be able to 'pause' the *token contract* which is responsible for managing any transactions regarding the tokens. Specifically, this will mean that no transactions can be made until the contract is un-paused.
- We also maintain centralised control of the projection screens via which artwork can be displayed, and the project website and any social media channels via which information about the project can be disseminated.

CityScreens NFT Research Study [TEMPLATE]

Participant Information Sheet

<mark>[*This sheet covers each stage of the research. In practice, depending on the precise implementation, this information may be presented in several parts rather than as a single form, in addition to being on our website].</mark>

> You are being invited to take part in a research study. Before you decide if you wish to participate, it is important for you to read this leaflet so you understand why the study is being carried out and what it will involve.
>
> Reading this leaflet, discussing it with others or asking any questions you might have will help you decide whether or not you would like to take part.

What is the purpose of this study?
This research study is part of the DeCaDE research project at the Institute for Design Informatics, University of Edinburgh. In this project, we are designing and experimenting with decentralised economies in the creative industries. In this specific study, we aim:

- To offer an opportunity for public engagement with Non-Fungible Tokens – more commonly known as NFTs.
- To facilitate and study how members of the public are able to be setup and onboarded with a 'wallet', which holds cryptocurrency and is a necessity of any interactions with NFTs or other blockchain-based systems.
- To understand how audience experience and value 'minting' their own NFT, and the novel forms of 'ownership' this can (or cannot) offer.

We are doing this by means of a public exhibition, via the City Screens at the InSpace Gallery, where participants will be able to create a unique artwork, and be guided to minting an NFT.

Why do we want to talk to you?
We're interested in talking to members of the general public, over 16 years of age, who wish to learn more about NFTs and decentralised technologies. Participation in this research is open to anyone who is able to engage with the CityScreensNFT installation at InSpace (https://inspace.ed.ac.uk/).

We anticipate as many as 100 people or more may create an artwork, and produce an NFT. In addition, we will survey or interview a selection of these participants.

What will you be asked to do?
There are three main activities to take part in this research. Please read this section carefully, to understand what we are asking you to do and how the technologies we are using will work. You do not require any prior knowledge or experience of cryptocurrencies or NFTs to take part in this research. **If you have any concerns or questions about the activities below, a member of the research team will be available to talk to you via the contact details at the end of this form**.

1) Creating an Artwork
First, participants will be invited to create a unique digital artwork by interacting with a street facing camera via a station and screen in the InSpace Gallery window which will function from [time x to y;

dates a to b]. This camera will only record a colour placed in front of it. When a colour is detected, the camera will feed this into a digital artwork, to create a unique image. You will be able to play with different colours, and create as many images as you wish. Once you are happy with the image created, you will be able to 'save' this image, and contribute it to the exhibition by providing an email address. This is the only interaction which must take place in-person.

2) *Claiming your NFT*

Once you provide an email address we will send you instructions about how to claim your NFT. An NFT is a unique digital token. Since they are 'non-fungible' – they cannot be duplicated or replaced – they are one of a kind. Each token, will be linked, uniquely to the artwork that has been generated. Therefore, whoever possesses this digital token, can claim to own or be associated with the artwork it references. Although the artwork itself can be easily copied, the token that represents it cannot. In this way, NFTs are being used to represent, exchange and manage rights associated with digital assets. In our research, we want to explore and understand individuals' experiences of creating and 'owning' such tokens.

NFTs rely upon distributed ledger technologies – the same technologies underpinning cryptocurrencies such as *Bitcoin* and *Ethereum*. A distributed ledger ensures that many people share a transparent record or ledger of every token created, where they are stored, and when they are exchanged. It provides a secure, trusted, record of ownership.

Therefore, to create and possess an NFT, requires you to set up a cryptocurrency *wallet*. A wallet is a digital application which allows users to store and exchange digital assets or tokens. Each wallet is also unique – and has its own address, like a bank account number. This address – which is public – allows others to send tokens to your wallet. However, when you set up your wallet, you will create a unique password and 'seed – phrase' that will be required to access and recover your wallet if you forget your password. It is vital that you keep these private.

In this project, we will use [Add wallet provide details] to provide you with a wallet. This application is a browser extension – meaning you will need to use an application like Google Chrome or Mozilla Firefox, running on a PC or laptop, to download and access your wallet. You cannot currently use a smartphone for this.

We will provide you further specific instructions on exactly how to create and manage your wallet via email, and via our website. However, here are the most important things you must know and remember about a cryptocurrency wallet:
- **All transactions a wallet makes are public and transparent.** Anyone in the world could examine the ledger and see which wallet makes a transaction. However, they will not be able to know who owns that wallet.
- You should not link any personal data – such as your real name or email address – to a wallet, unless you wish to make your transactions public.
- You are responsible for looking after your wallet and remembering your password and seed phrase. Unlike other internet services**, there is no other record of these details, and you cannot recover your password via email.** The research team will have no record of who owns which wallet, and we will not be able to help you recover a wallet if you have forgotten your password and seed phrase.
- Wallets cannot be deleted. However, if you cannot access them – they are effectively lost.
- You may create and manage multiple wallets, with multiple services, should you wish.

If you wish, you can learn more about cryptocurrency wallets via this guide:
https://creatoreconomy.so/p/curious-beginner-guide-to-crypto-wallets

In this project, we do not anticipate any particular risk to you in creating and managing a wallet. The most likely risk is that you may lose access to your wallet and hence the NFT related to the artwork you helped to create. However, it is important for you to be aware that if you make any other future transactions with your wallet, these will be visible (though your identity will not).

3) *Using your NFT and Interacting with Artwork*

Once you have created your wallet, you will be able to – anonymously – claim the NFT related to your artwork. We will give you clear instructions how to do this, via email and via our website.

Through ownership of this NFT, you will be able to prove that you created your artwork, and you will gain particular rights regarding the artwork.

You will also be able to use your NFT to interact with the artwork and the exhibition. For example, you will be able to use your NFT to control how and when the artwork appears in the exhibition. You will also be able to remove it from the exhibition. [We will add more specific details on exactly how people will be able to interact with their NFT at InSpace].

These interactions, and all transactions are governed by code called a 'token contract'. This sets the rules about how NFTs can be used. If you wish, you can inspect this code via our project website. Like the tokens and wallets themselves, this code cannot be changed. However, it is possible for the code to be paused, by the administrator who owns the contract – in this case, the research team. This will be done when the project is concluded. At this point, no further interactions will be possible.

Importantly, unlike other NFTs, **your NFT will be non-transferable.** This means it cannot be moved from one wallet to another, and it cannot be sold via an online marketplace. For this reason**, we do not anticipate your NFT to have any financial value.**

An NFT cannot be deleted, however, if you are unable to access your wallet, you will lose access to your NFT and it will be irretrievable.

4) *Taking part in an interview, survey or further research event*

The purpose of our research is to understand individuals' experiences and attitudes towards NFTs, and this new way to manage the ownership of digital assets and artworks.

On this basis, we will invite some participants who have claimed an NFT to tell us about their experiences. We may invite you to take part in a short interview, or complete an online survey. We will ask you about your experiences of the exhibition, and your views around owning and having rights over digital assets and artwork via NFTs. Interviews will be conducted remotely, via video-conferencing software, and last between 40 minutes, to 1 hour.

Risks to Taking Part
Taking part in this study is entirely voluntary. The risks to you taking part in this study are very low.

1) *Losing access to your wallet*
The primary risk is that participants become unable to access a wallet they have created – and any tokens held within them. This could lead to disappointment and an inability to participate in the study as intended. We will give you clear instructions on how to avoid this.

2) In-person interactions and Covid-19

There is extremely low risk of being exposed to Covid-19 in this study. Interacting with the CityScreensNFT exhibition will take place entirely outside, and be hands free. You will interact only via a camera, or your own device. Interviews will be conducted remotely, via video-conferencing software. Any further in-person events related to the research will be entirely voluntary, include alternative options for online participation, and take place in strict accordance with University and Scottish Government guidelines at the time.

3) Secondary risks of other Cryptocurrency products

This study is not intended to promote or encourage interactions with any other particular cryptocurrency or NFTs. No prior understanding or engagement with these technologies is required to participate in this research. However, it is important for you to know that most cryptocurrencies and NFTs are a form of speculative asset – meaning their valuable is very unpredictable. There are also many examples of fraud and misrepresentation, and there is very limited regulation of cryptocurrency services and assets. For all these reasons, we would encourage anyone considering investing in any other crypto-asset to think and research very carefully before making any investments and only to invest money that you can afford to lose. You do not need to invest any money to take part in this research project, or to own a cryptocurrency wallet.

You may also be aware from popular reporting that blockchains can be harmful to the environment since they require large amounts of computer power. To mitigate this, we have developed this project using the Tezos [link] blockchain which is considerably less energy intensive due to its reliance on a 'proof-of-stake' algorithm.

Withdrawing from the Study
You can pause, or withdraw from the study at any time, without giving any reason.

You can create an artwork, without creating an NFT or providing an email address. In this case, your artwork will not be stored, or presented in the exhibition.

You can create an artwork, and an NFT, without interacting any further with the exhibition. You may also choose not to participate in any survey or interview.

During any interview or survey, if you don't want to talk about or participate in something just say, and we will always respect your wishes.

If you wish to withdraw your participation entirely, it is important to note that the artwork itself, your wallet and NFT cannot be deleted. However, you will be able to:
-   Remove your artwork from being shown in the exhibition or any future show.
-   Delete and forget any record of your seed phrase and password, meaning your wallet is inaccessible and hence permanently lost.
-   Ensuring there are no other records connecting you to your wallet or the artwork (e.g. via a social media post)
-   If you provided an email address, or took part in any survey or interview, informing the research team, who will remove any research data about your participation. However, you should not tell us your wallet address when you do this – we have no control over this data.

Will you be compensated for doing this?
Participants who take part in the exhibition will have the opportunity to create a unique artwork, and claim ownership of an NFT, at no cost. Please note, we do not anticipate any financial benefits to ownership of this NFT.

Participants who take part in an additional survey will be entered into a prize draw with the opportunity to win a shopping voucher worth £50.

Participants who take part in an interview, lasting up to one hour, will receive a £20 shopping voucher, as a token of thanks.

Confidentiality and data
Any information gathered will be treated confidentially. We would like to record audio of interviews in order to produce a transcript of the conversation. Surveys will be conducted and recorded through JISC Online Surveys (https://www.onlinesurveys.ac.uk/).

We will anonymously record data about interactions with the exhibition itself, including when artworks are created, the colours presented to generate new artworks, and the use of NFTs to interact with the exhibition.

We will also collect anonymous usage statistics of the project website.

As above, all transactions via wallets with the blockchain are anonymous, but permanently recorded. We will use this data to determine how many NFTs are claimed.

Crucially, personally identifiable data, such as an email address, will never be connected to your wallet address.

In summary, your information will be stored in a secure way, and you can have access to it if you wish. You can also get in touch with us at any time and ask for your data to be deleted – with the exception of anonymous data recorded on the blockchain. Unless you state otherwise and we have your express consent, you will not be named in any public presentation of the research, your participation will be entirely anonymous, and your identity will not be revealed at any point or in any subsequent publications. 'Your data' refers only to the consent form, and the data gathered as part of the study, specifically, email addresses, interview recordings, and survey responses. We have a number of ways in which your data might be used and stored. Specifically:

Data that includes your personally identifiable information might be:

- On a secure encrypted hard drive for up to ten years
- On a secure University of Edinburgh data management portal for up to ten years
- Used in developing and publishing the findings of the research, only if we have your express consent for this.

Anonymised data, from which your personally identifiable information has been removed, might be:
- Used and quoted by the University of Edinburgh in developing and publishing the findings of the research
- Stored on a secure University of Edinburgh data management portal indefinitely, subject to review every 3 years.

Use of results
The information gathered as a result of this study will be used to support the wider DeCADE project https://decade.ac.uk/ . It will also inform further studies we undertake on these topics, especially where we aim to provide users with cryptocurrency wallets, tokens and assets.

The final results of this project will be read by academic audiences, such as in academic journals and conferences. In addition, we expect the exhibition itself to provide a platform for critical and informed discussion of NFTs across the University of Edinburgh, and the creative and tech sectors in Edinburgh.

Will you be able to change your mind about taking part?
Yes, you can withdraw at any point. If you feel that you no longer wish to take part at any time just say so and we will stop, and destroy all identifiable records of your participation.

You may also contact us after the study and ask us to withdraw your data from the study if it has not yet been anonymised.

However, as explained above, it is not possible to remove information recorded in a public blockchain. A record of any transactions undertaken by your wallet will persist. However, we will not at any point associate personally identifiable information with your wallet address and it will be entirely anonymous.

Who are we?
This study is part of the DeCADE project https://decade.ac.uk/, a research centre and collaboration between the University of Edinburgh and University of Surrey, funded by UKRI (https://www.ukri.org/) to study how decentralised platforms enabled by emerging data-centric technologies like Artificial Intelligence, Distributed Ledgers and Blockchain transform our future economy – and the way we work, interact and create value.

This study is led by Dr. Chris Elsden (Chancellor's Fellow in Service Design) and Dr. Evan Morgan (Research Software Engineer) based in the Institute for Design Informatics (https://www.designinformatics.org/), part of Edinburgh College of Art.

What happens next?
If you are interested in taking part, please read carefully and sign the consent form when it is provided to you, and return this via email to Dr. Chris Elsden [chris.elsden@ed.ac.uk]. If you have any other questions about the research, or require help to understand any details of this form please contact Chris.

Thank you for reading this information.

Consent Form [TEMPLATE]

[City Screens NFT]   **Please tick each box**

1.   I confirm that I have read and understood the information sheet (attached) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2.   I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

3. I understand that my name will not appear in any reports, articles or presentations without consent being sought for this separately.

4. I agree that anonymised demographic data, audio recordings of interviews and anonymised transcripts from this interview may be used as outlined in the information sheet [LINK] and following data policies:

Data storage
Data containing personal information (i.e. consent form, demographic data, interview transcripts and audio recordings of interview) will be stored in the following ways:

5.   On a secure encrypted computer, belonging to the University of Edinburgh and prepared to University of Edinburgh standards, for a maximum of ten years.

6.   On secure University of Edinburgh data storage for a maximum of ten years.

Anonymised data (not containing your personal information) will be stored:

7.   On secure University of Edinburgh data storage indefinitely (subject to review every three years).

Data management/ sharing
8.   Anonymous data can be used by DeCaDE research staff at the University of Edinburgh and University of Surrey in developing academic reports, journal articles and presentations.

9.   I agree to take part in the above research.

_____   _____   _____
Name of Participant   Date   Signature

_____   _____   _____
Name of Researcher   Date   Signature