DIGITAL DESIGN FUTURES IN SCOTLAND

Introduction

THE SCOTTISH DIGITAL DESIGN SECTOR IS VIBRANT, AN EXPANSIVE FEATURE OF URBAN CLUSTERS LIKE DUNDEE (GAMES & COMICS), EDINBURGH (DATA & FINTECH) AND GLASGOW (WEB DESIGN, AFFILIATES, ALTERNATE AND VIRTUAL REALITY APPLICATIONS). It is largely (99.4%) made up of small to medium sized enterprises (SMEs) (Scottish Government, 2017) which can operate with informality and independence, but also face challenges accessing know-how and finance. Smaller digital design companies are more likely to pursue commission work in order to survive, which means that they lose the opportunity to develop a scale-able income through the research and development of new products[1]. As a result, previous studies of Scotland's creative industries (Chisholm et al., 2014, Creative Scotland, 2016) have repeatedly called for widespread networking support and mentorship schemes in order to help grow the Scottish economy.

Yet, growth takes many forms (Creative Dundee, 2017, EUROCITIES, 2017). A significant number of creative practitioners interviewed for this project talked about growth in terms of portfolio development, or international standing rather than enterprise size. In other words, whilst many practitioners do seek to grow their businesses, many also don't want to scale. They want to make a living doing what they love.

"FRAGMENTED JUST MEANS THAT THERE'S LOTS OF VALUE PROPOSITIONS AT PLAY."
Digital designer

[1] *Indeed, Edinburgh's CodeBase which is the largest tech incubator in the UK actively pushes companies to develop products that can scale (which includes subscription software services) rather than provide services that require extra staff to grow. See http://www.thisiscodebase.com*

This quote from a digital designer who plans to build Scotland's top virtual reality games production company reflects a set of values expressed repeatedly during the course of this study: Scotland's digital design community is ambitious, but also fiercely committed to creative culture and lifestyle values. It is possible to infer from this that the more that development programmes for Scotland's digital design sector can align with these values, the more likely they are to succeed.

Aims and method

We wanted to know if it is possible to use data sharing technologies to support growth in the digital design sector, but in a way that affirms practitioner values and lifestyle choices. To find out, we undertook over 40 interviews and a short online survey with industry representatives including recent graduates, creative practitioners, creative technologists, entrepreneurs, academic researchers and government agents. In addition, we also undertook two additional projects to explore what data sharing technologies - like blockchains and distributed ledgers - might offer for Scotland's creative industries. These were:

"WE DON'T WANT TO GET RICH – I MEAN OF COURSE YOU DO, BUT OUR AIM IS NOT TO GET RICH, OUR AIM TO SUSTAIN A STUDIO AND MAKE VIDEO GAMES FOR OUR LIVES."
Game designer

1. A STUDY OF THE COLLABORATION EXPERIENCES of small game design teams and how those experiences might relate to the UK Games Fund's experimental blockchain based creative licensing system, The Global Tal Registry (Durrant and Hogarth, 2016).

2. A PRELIMINARY DESIGN for a local Dundee digital coin or token, developed over the course of two separate workshop events in the city.

What is DIGITAL DESIGN?

Digital design is complex to define. Many people interviewed for this project either struggled to define it or linked digital design to web development.

The contemporary creative digital context is characterised by the merger of marketing and content (such as playful social media campaigns), media and technology (such as all media forms accessible on one mobile phone) and the need for collaboration between different production skill-sets (such as art and computer science). Digital products and services are generally interactive and lend themselves to participatory culture activities, such as digital file-sharing and remix cultures. As a result, it is perhaps truer to say that digital designers create experiences that unfold over time, like processes and relationships[2]. The digital design sector could therefore be said to include all those who design digital products and services that prompt networked events and experiences.

"WHEN I STARTED DOING GAMES DEVELOPMENT I WOULD USUALLY CALL MYSELF A GAMES DEVELOPER, BUT WHEN I STARTED MOVING AWAY FROM THAT AND ALSO DOING WEB DESIGN AND GRAPHIC DESIGN I WANTED TO CALL MYSELF MORE OF A DESIGNER. I DESIGN SOLUTIONS IN COMPUTER SCIENCE AND IN GAMES AND IT'S MORE ABOUT BEING CURIOUS AND WANTING TO SEE HOW THINGS CAN BE CHANGED, TRYING TO FIND SOLUTIONS."
Digital designer

[2]*This loose definition could easily be complicated by adding that networked, variable and unfolding process emerges out of a digitally enabled event space characterised as much by the networked media prompts in place, as by the communities that engage with them. However, for the sake of clarity a simpler definition is preferred here.*

WHAT IS THE **BLOCKCHAIN?** Blockchain technologies power cryptocurrencies like bitcoin, but they are about much more than money. Fundamentally, blockchain technologies are systems for secure and direct exchange between people, without the need for third parties like banks to ensure that a transaction has indeed occurred in line with the accounts. This facility has many potential applications because digital records can represent anything, including votes, or medical information. Equally, it is possible to incorporate pre-agreed automated events known as smart contracts that can enact themselves, like the agreement that if A happens, B will occur. In tandem with services that ensure that B can indeed happen, when A occurs (by putting money aside in a linked account, for example), these technologies enable strangers to be sure that an exchange will occur as agreed.

There has been a lot of hype about blockchain technologies in the wake of the 2017 cryptocurrency bubble — and subsequent 2018 crash, with just as many let downs. Cryptocurrencies have not as yet been able to capture the broader consumer market, for example, largely because they are still slow to process, hard to use, costly and subject to speculative price changes. Nevertheless, new uses for data sharing technologies continue to emerge across industry. These automated technologies can authenticate trade much more quickly than traditional paper trail methods. It is also helpful if related institutions can know what all the others are doing.

Bitcoin transaction records are public and semi-anonymous, linked to verified but also coded identities, whereas other data sharing technologies known as distributed ledger technologies involve shared record keeping systems that require authorisation to access.

THE **NETWORK EFFECT** To put these
emerging technologies in a global context, the
contemporary digital economy is connected, shared,
personalised, tracked, analysed and increasingly
automated (Potts, 2016). Without accountable data trails,
the digital economy is also complex, vulnerable to fraud
and exploitation. It is very hard for creative practitioners
to track their work once it is published online, for example.
Those who do sell online often need to do so through
central distribution platforms such as Spotify, the music
discovery platform that pays an average of just $US0.007
each time a music track is streamed on their network. This
fee is paid to the music rights holder, which might include
a record label, producers, artists, and songwriters. Large
online networks like these are relatively easy for consumers
to find in a sea of many other smaller enterprises and the
more that these businesses grow, the more cost benefits
they gain. As a result, today's internet displays "monopoly
tendencies driven by network effects" (Srnicek, 2017: 27).

In the creative industries these same network effects can
create vast income gaps (Weeds, 2012). For example, one
film production agent interviewed during this study will
only represent people who are the top in their field. He says
that there's no point trying to promote the rest because
there simply isn't enough work to go around. As Angela
McRobbie so sharply observes in her book "Be Creative:
Making a living in the new culture industries", the creative
economy is increasingly linked to a career characterised
by gig work, where there is no minimum wage and worker
rights are progressively eroded. Faced with this, McRobbie
(2018) argues that the choice to be creative has become
a new type of labour reform. Whilst a few 'super-stars'
(Mulligan, 2014) enjoy enormous wealth, the majority of
small to medium size creative digital enterprises struggle
to secure increasingly uncertain incomes (McRobbie,
2018). Furthermore, the skill set required to stay current is

constantly changing. This challenge is aptly illustrated by the experience of one aspiring blockchain technician, also interviewed for this study whose small web development business fell away when his previous clients started making their own websites using free programmes like WordPress. The digital economy is dynamic and fluid, but it can promote poverty, as much as wealth (WEF and Accenture, 2016).

FLEXIBILITY DEMANDS **FLEXIBILITY**

The challenge to build a steady income is complicated by the need to develop a skill-set that is interdisciplinary enough to collaborate effectively, but also specific enough to support a clear career identity. Digital skill maintenance can be expensive and lifelong learning is often left up to the individual who may not have the time, nor the money to attend part time meetups and classes (Design Council, 2018). Many businesses struggle to secure skilled programmers who can cope with ever more complex technologies; at the same time each year more graduates face uncertain futures. Three months out, none of the five recent graduates from amongst the animation, product design and interactive design streams of the Duncan and Jordanstone College of Art (DJCAD) in Dundee interviewed as part of this study had secured a Creative Industries job. Meanwhile, a small group of graduates from the Dundee University of Abertay's game design course also interviewed during this study plan to fund their independent production efforts by doing freelance work.

The challenge that these new graduates face is that the AAA games market has shrunk, leaving few publisher deals. The mobile games market, so accessible for independent developers is simultaneously overwhelmed with content, making it hard for new games to reach a wider audience. Steam, the popular indie games distribution platform takes 30% commission and also

promotes a sale by notification model that pushes down prices. Alternatives like itchio.io (An alternative online indie games distribution platform which offers a 'pay what you like' open revenue model) and blockchain secured data sharing options that enable players to monetise time spent playing games by owning and trading in game assets are gaining ground, but still no guarantee of a regular income stream.

These challenges need flexible solutions. Some interviewees expressed frustration at what they perceived to be the more formal, one size fits all business training on offer. Even when people with relevant advice can be found the next challenge is how to not burden them with questions. There is an urgent need for more flexible, yet targeted grass roots support programmes for recent graduates in particular, as well as the growing number of entrepreneurial school leavers reportedly approaching local networking organisations for advice.

Public interventions are helping to address these challenges, illustrated by the difference that regular funding status makes to the sorts of services available. Of the 19 new additions to Creative Scotland's 2018 – 2021 Regular Funding Network at least five are grass roots networking, or consortium organisations. Other interventions include the establishment of short-term business incubators, as well as flexible and independent, industry responsive technical skills training delivery organisations such as Codeclan in Edinburgh. Networking organisations such as Create Converge, Creative Dundee and Creative Edinburgh are also working to forge alternate creative work opportunities within the public service, legal and medical industries. Efforts such as these are helping to build more inclusive, skilled, connected and informed digital design communities in Scotland – but a lot more still needs to be done to sustain Scotland's Creative Industries.

"IT FEELS LIKE UNLESS YOU'RE A BIG TECH COMPANY THERE'S NOT A LOT OF INTEREST IN SMALL COMPANIES RIGHT NOW, WHICH IS DISAPPOINTING. UNLESS THERE'S A COMMERCIAL PRODUCT BEING PRODUCED THAT CAN MAKE MONEY REALLY QUICKLY... IT'S VERY DIFFICULT TO GET FUNDING AS A DEVELOPER UP HERE."
Independent consultant

FLEXIBILITY ALSO NEEDS **SUPPORT FRAMEWORKS**

In addition to inequality, the digital design sector struggles with diversity issues. According to the latest UK Tech Nation report, the average gender split in tech industries across the UK is roughly 80% male, 20% female. Related survey results (Browne, 2018) are alarming, indicating that many young women think that they 'don't have the skills' (45%) and technology is not for people like them (24%). Although the UK Tech Nation report has identified meetups as the hub of the tech community, highlighting emergent trends such as AI and blockchain, nevertheless during October 2018 when the Scottish Blockchain Meetup group in Edinburgh hosted Susan Ramonat, its first solo headlining female presenter for the year, only 8 out of 65 reported attendees identified as female.

This is an urgent challenge, with no easy fix. In contrast to the low participation rates in the technology sector, the Facebook group for the annual NEoN Digital Arts Festival in Dundee identifies as 55% female, marking it as a discovery point for women. In addition to the digital visual arts, more humanist aspects of the industry, like user experience design attract women. The Edinburgh User Experience (UX) Meetup group generally attracts a 30% female participation rate, and at least two of the five members interviewed from that community cited equal gender distribution in their work teams.

Finding the right balance to ensure that all parts of Scotland's creative digital design sectors are places where women feel comfortable, encouraged, supported and welcome is a national challenge.

THE VALUE OF **BRIDGES**

Research has shown that the most innovative and creative solutions emerge when different types of people work together (Johansson,

46 MEETUPS

Highland 1

Stirling 1

Aberdeen 2

Dundee 2

Glasgow 12

Edinburgh 28

LARGEST MEETUPS

Scottish Data Science & Tech meetup Edinburgh / 2986 members

Scottish Blockchain meetup / 1698 members

IOT Scotland meetup / 1401 members

2017). Numerous digital design collaborations are now underway in Scotland. During the NEoN 2018 festival, for example, The Citizen of Nowhere collider project brought together creative practitioners from across tech and theatre together to collaboratively engage with emerging AI and data technologies.

Structural pathways for collaboration are helpful because many groups are still simply co-existing. Crossing between the blockchain arts community and blockchain tech meetups, for example was jokingly described by one interviewee as something akin to crossing between international border controls. As previous studies (Brook et al., 2018) demonstrate, the creative sector is all about relationships but like mixes with like, often more than it realises.

Recognising this, dedicated brokerage firms have started to emerge, as well as entities such as CivTech® (part of Scottish Government's Digital Directorate) in Edinburgh which has developed an alternative public procurement process. The CivTech® model (which took 146 meetings to get off the ground) was born out of a frustration with what founder Alexander Holt described as "lip service paid to collaboration historically."

Effective collaboration requires the ability to negotiate different world views and yet the need to continually translate between them can also make collaboration a clunky process. CivTech® disrupts traditional procurement which tends to favour larger supplier companies. Rather than specify a product to be made, the CivTech® approach starts with the problem to be solved and invites anybody, regardless of their training, or background to submit potential solutions. This open challenge-based approach progresses through a paid, step by step pathway designed to allow the best new ideas, technologies and companies to emerge.

"BUSINESS PEOPLE ARE TOO MUCH OF A CULTURAL SHIFT — WE NEED TO KNOW HOW CREATIVE PRODUCT DESIGN RELATES TO INDUSTRIAL BUSINESS DESIGN — WE NEED CREATIVE BUSINESS PEOPLE TO TEACH US."
A recent DJCAD Graduate

"(PUBLIC SERVICES WERE) WRITING SPECS FOR STUFF THEY DIDN'T UNDERSTAND, GOING OUT TO THE MARKET PRESUPPOSING THEY KNEW WHAT THEY WANTED ...A NEW WAY OF GETTING THE RIGHT PEOPLE AROUND THE TABLE AT THE RIGHT TIME WAS REQUIRED."
Holt, 2018

TOP 400 MEETUPS
HIGHLIGHT EMERGING
TRENDS, WATCH OUT FOR
AI AND BLOCKCHAIN

AS THEY TAKE
CENTRE STAGE IN THE
CONVERSATION

Emerging
technology

Web
design

Open
source

Software
development

Java

Artificial
intelligence

A map of UK Tech Meetup
Clusters courtesy of the 2018
UK Tech Nation Report

What do blockchain technologies offer for Scotland's Creative Industries?

Smart data sharing technologies can also support collaboration efforts. Automation may not be able to capture all the flavours of creativity, but it can capture information that people can't easily process, like GPS co-ordinates and statistical relationships between large collections of data. In effect, we don't just collaborate with each other. Now, we also collaborate with computers, which is helpful precisely because they don't think like us.

Computerised forms of exchange open up a whole new way for people to interact. Their security rests on the likelihood that whereas it might be relatively easy to break into a single database, it's a lot harder to cheat multiple identical databases.

THE TRAIN TRUST ANALOGY For example, imagine that you are on a train at peak hour and you want to go for walk. Making sure that everybody in your carriage overhears you ask the person sitting next to you to mind your bag whilst you do so will help to ensure that it is also there when you get back. The multiple, identical transaction records that form blockchains and blockchain inspired distributed ledger technologies[3] act like a train carriage full of people all keeping an eye on your bag. Blockchain technologies involve much more than this, but the idea that multiple computer eyes create a shared, duplicate database that is checked and updated as one, linked process between a group of computers is a key aspect of how they work. As a result, these sorts of data sharing technologies create a dynamic mechanism for value exchange that in the future is expected to increasingly link in with autonomous (self-managed) artificial intelligence to the point that machines can trade securely between themselves, like a self-driving car that can analyse the best route home and recharge itself at traffic lights.

Ironically, blockchain technologies create collective security on the back of self-interest and competition. The first cryptocurrency, bitcoin, is still the most secure of all the cryptocurrencies due to a costly and energy consuming proof of work authentication process driven by the promise of financial reward. Blockchain technologies can successfully co-ordinate self-interest for shared benefits but they are not by their nature public services and need to be designed accordingly.

13

So, how are people using this technology?

1 PEER TO PEER MARKETS

By making it possible for strangers to conduct secure transactions online, blockchain technologies effectively bypass the need for third party authentication via banks and notaries. They don't do away with middle management entirely because blockchain applications are expensive to produce and still need to work effectively, but the general aim is to create more accountable and direct markets. These computerised systems can process transactions quickly and cheaply.

2 DIGITAL ASSETS

Because anybody can copy and paste digital files, digital ownership used to be impossible to manage. Blockchain technologies use the collective checks and balances of distributed ledger systems to securely log a digital file and also potentially track it over time. Thus far, the new digital art market emerging out of this capacity is strongly linked to meme cultures which eagerly trade quirky collectables like the Rare Pepe[4] cards and the popular Cryptokitties[5] game.

3 SOCIAL VALUE

Transformation When digital tokens are linked to the way that things are valued, the potential to change those values also becomes part of the equation. Blockchain technologies can be used to certify particular behaviours, for example, like fair trade. Such standards still need to be developed in partnership with real world audits. Nevertheless, this level of transparency can make industry more accountable. Creative communities are more likely to be motivated by creativity opportunities, rather than financial incentives, but when meaningful reward structures are in place blockchain ecosystems can

also help to change social, economic and cultural practice.

Creative interpretations of these efforts include the Edinburgh Design Informatics Centre's Bitbarista[6] creation, a coffee machine with its own bitcoin wallet that processes coffee transactions of its own accord, so that it can take votes on preferred fair-trade beans, but also give discounts to people prepared to run the cleaning cycle or replace the milk. Other compelling applications of this transformative potential include the work of Glasgow based artist Ailie Rutherford[7] who plans to develop a

feminist cryptocurrency. The Govanhill swap market informs these efforts, a tongue-in-cheek nod to traditional financial markets that is instead designed to promote conversations as well as recognise the valuable skills and assets on hand within the community.

Initiatives such as these which make use of existing but unrecognised, or under-utilised values can create more wealth in kind for everybody concerned. At the same time, the risk that everything might soon be turned into a digital value known as a token raises complex questions, some of which will now be considered in the hypothetical design of a Dundee token.

[3]Ledgers are accounts, or databases. Distributed ledgers are identical ledgers that are distributed amongst a group and continue to be duplicated with every transaction. See WALLET SERVICES. 2018. Distributed Ledger Technologies in the Public Services [Online]. Available: https://www.gov.scot/publications/distributed-ledger-technologies-public-services/pages/7/ [Accessed 3.8.18]. Other related innovations include the prospect of a de-centralised internet. The Scottish company Maidsafe for example, has been working since 2006 to build a globally accessible, private and secure peer-to-peer internet. See https://maidsafe.net

[4]Rare Pepes are prized for their insider appeal. See https://knowyourmeme.com/memes/rare-pepe

[5]In the cryptokitties game owners register a piece of code on the blockchain, said to represent the kitty's DNA which they can then trade, mix and match in order to generate new breeds of crypto-kitties. https://www.cryptokitties.co

[6]https://www.designinformatics.org

[7]https://thepeoplesbankofgovanhill.wordpress.com and https://inkindproject.info
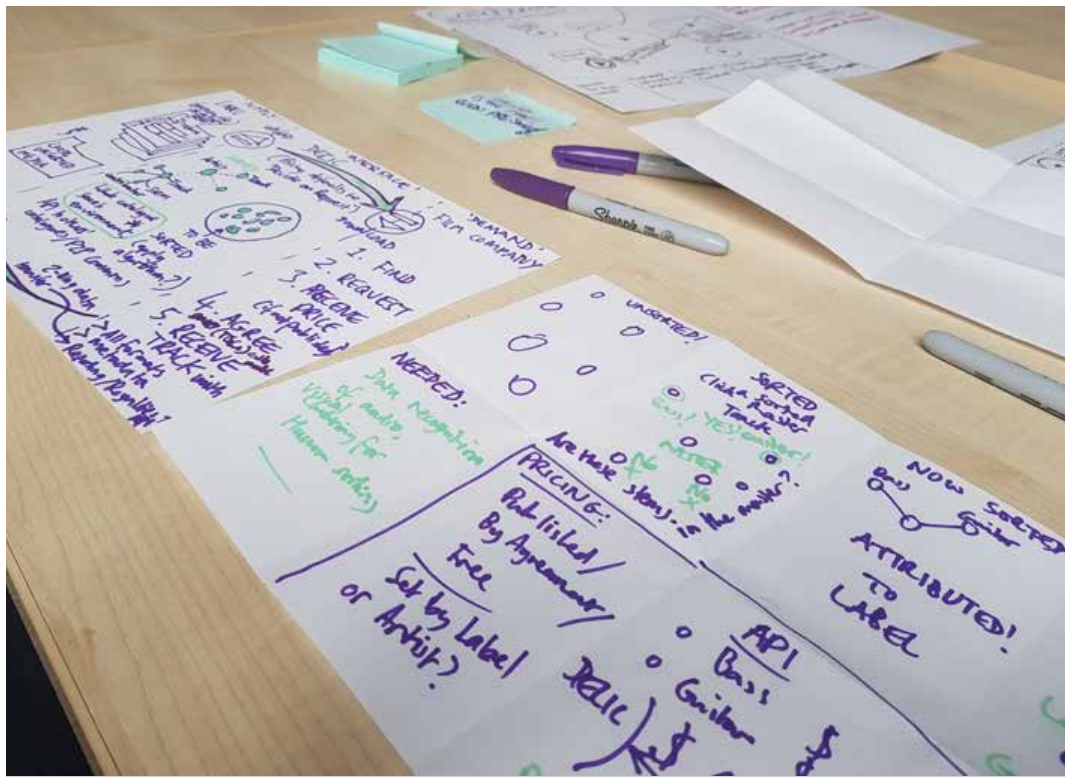
Design notes for the DELIC music collaboration platform being developed in order to give musicians a way to manage and track online collaborations. This facility also links to blockchain copyright registration options.

A Dundee token?

Locative technologies can transform locations, but cultural change is more complex and takes time. It took Dundee almost twenty years to see the results of a formal, pioneering decision to pursue a culture led regeneration programme. Dundee is now an affordable city that also celebrates heritage, contemporary dance, art, film, theatre, libraries and new design. It is the home of the Scottish Dance Theatre and also supports three city art galleries, including the recently opened V&A Museum of Scottish Design, all within easy walking distance of Dundee's new Waterfront.

There is still long-term unemployment and drug dependency in large parts of the city however. In many ways Dundee is a city divided between the vibrant creative sector and those at risk of being left out in the cold. Inclusion is an ongoing priority.

Against that backdrop a potential Dundee token was developed over 2 collaborative workshops. These suggestions are intentionally playful, rather than a complete design and are not intended to replace community support frameworks.

"SUSTAINABLE CHANGE REQUIRES COMMUNITY BUY IN ... THERE'S LOTS OF PEOPLE WHO SAY NO FIRST OF ALL ... IF YOU'RE COMMITTED TO SOMETHING YOU NEED A STRONG IDEA AND YOU NEED POLITICAL SUPPORT ... DUNDEE IS A CRITICAL AUDIENCE – THE LEARNING FROM THAT IS THE IMPORTANCE OF BEING STRAIGHTFORWARD ... AND THE IMPORTANCE OF RELATIONSHIPS."
Dundee Council Officer

ACTION 1 **DUNDEE VALUES** Participants of a Sharing Insights Blockchain workshop at the University of Dundee in September 2018, were asked to brainstorm all the values that they might want to promote in Dundee. They chose these: Healthy – Growth – Productivity - Self-sustaining – Process – Creative – Vegetarian – Trustworthy – Modular – Scalability – Northern – Dark – Networked – Joyous – Permaculture – Wild - Community worth – Nourished – Holy – Free – Pride – Communism – Reflective – Optimistic – Kind - Time to Play – Enjoyment – Experience – Autonomy - Help others - Build Together.

ACTION 2 **REWARD TOKEN** In a follow up studio talk at DJCAD in October 2018, a group of creative practitioners and academics were asked to think up a design for a token to reward those values. One group nominated the image of an angel as a way to reward kindness. This is a powerful image as it is already familiar and can be interpreted in different ways. It also has broad appeal and emotional impact. Furthermore, angels can move and grow, which also invites animation, or automation.

ACTION 1 **VALUES**

ACTION 2 **TOKEN**
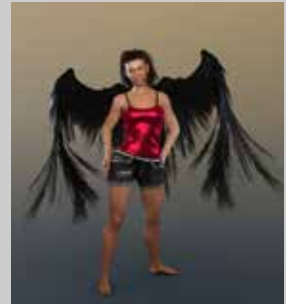
ACTION 3 **INTERVENTION**

ACTION 3 **DESIGN INTERVENTION**

In response to concerns raised during the first 2 actions that cryptocurrencies might commodify things beyond price and can easily be used for illegal drug trade and tax evasion, the potential applications for this token considered here focus upon digital design interventions that emphasise co-operation, rather than free trade.

1. TAKING INSPIRATION FROM THE HIGHLAND TITLES[8] APPROACH TO LAND CONSERVATION which divides natural heritage sites into tiny shares, to be sold separately in order to make future development impossible, angel packs (comprising a digital angel asset) can form a reward for charity donations to help crowd-fund micro-shares in co-operative housing and creative spaces in cheaper areas of Dundee which are nevertheless accessible to the city and at risk of gentrification.

2. ESTABLISHED PRACTITIONERS WHO PROVIDE USEFUL AND TARGETED NETWORKING SUPPORT can also be given a digital angel asset in exchange for each week of on-call support. Incremental sets of 10, 50 and 100 angels generate advanced computerised results, like animations and game-play options.

3. TAKING INSPIRATION FROM THE ARTIST'S PENSION TRUST[9] APPROACH TO INCOME REDISTRIBUTION which stores retirement savings in the form of art deposits, to be later sold and their takings redistributed in a near 60/40 split between co-operative members, Dundee's digital designers can release co-operative graduate bundles in the form of "angel investor" packs that can only ever be on-sold through a linked sales agreement that automatically distributes commission payments to all the creatives registered in the original bundle.

[8]*https://www.highlandtitles.com*
[9]*https://www.mutualart.com/Apt*

19

Data sharing

As frameworks for secure peer to peer value exchange blockchain technologies can also be used to help support local networking, as well as cross-sectoral collaborations in order to build up a combined, shared repository of industry knowhow such as optimum production methods, proven time-scales, average costs and the like.

This final case study comes from the gaming development industry which is commercially oriented, but also highly collaborative and prizes creativity. It thus provides a helpful study of the ways that formality, informality, strategy, spontaneity, independence, interdependence, machines and people might co-exist.

What blockchain and data sharing technologies can offer are secure strategies for collaborative IP generation, free from the fear of theft, or fraud and the confusion of how to price oneself. The whole chain can price itself, and individual percentages can be more easily apportioned. This capacity is efficient, but in and of itself it is still not able to create a communicative community. Data sharing technologies don't solve collective action problems but provide a useful tool to help communities undertake this work.

"THE PROBLEM YOU'VE GOT WITH DEALING WITH COMPANIES YOU'VE GOT TO FILL OUT YOUR CONFIDENTIALITY AGREEMENTS. EACH COMPANY HAS THEIR OWN ... STANDARDS, SO THEY'RE NOT GOING TO SHARE UNTIL THEY MEET THE SAME LEVELS. IT'S ACTUALLY A VERY DIFFICULT THING TO DO – YOU SIGN A CONFIDENTIALITY AGREEMENT, BUT IT DOESN'T MEAN YOU'RE GOING TO SHARE EVERYTHING. ...INTELLECTUAL PROPERTY (IP) IS TREATED EXTREMELY SERIOUSLY. IT'S LIKE GOING IN AN AIRPORT TO GO TO THESE COMPANY SITES. IF YOU'VE GOT ANY WIRE OR METAL ON YOU LIKE UNDERWIRE BRAS, OR METAL ZIP JEANS HAVE TO BE TAKEN OFF AND THEN YOU GET IN. IT'S THE SAME GOING TO THE BATHROOM, YOU GO THROUGH SECURITY GOING IN AND OUT. IF THE SCANNER GOES BEEP YOU'RE ASKED TO CHANGE. YOUR CLOTHES ARE X-RAYED AND YOU GO THROUGH A SCANNER AGAIN."
Supply chain automation consultant

CASE STUDY 2
The Global Tal Registry: Automation and licensing

Large corporations can be highly competitive. Many also require a level of formality that is completely at odds with the ways that people in the Creative Industries might come together to imagine, play and make things anew.

Commercial competition is also no guarantee of public responsibility. Interviewees from this study discussed concerns about the number of innovations coming out of industry that pose serious social risks, like toys that have an open audio connection with the internet. Whereas legislation may struggle to keep up with the pace of technological change, there does seem to be value in the introduction of more flexible ethical review systems. With clear evaluation strategies in place, it might be possible to free up IP controls enough to more readily encourage collaborative innovation.

With that in mind this study also explored current, as well as potential, uses for the Global Tal Registry, an experimental project IP distribution/control tool within the team that registers revenue shares and voting rights. This alternative IP distribution tool has been developed by the UK Games Fund based in Dundee. In a bid to provide some support for the fragility and fluidity of collaborative creativity the Tal Registry is designed to help young game development teams document IP distribution without the need to form a registered company. Like shareholder rights, Tal divisions register a system of voting rights and revenue shares negotiated by each team on a flexible and semi-regular basis.

The Global Tal Registry was tested during Tranzfuser, a UK Games Fund competition. Tranzfuser challenges graduate teams across the UK to build a prototype game during the UK Summer and showcase it in September at the enormously popular EGX Games Expo in Birmingham. During this event 18 hopeful teams each consisting of 4 or more budding games makers gather to show a demo game to prospective publishers and gaming enthusiasts.

The study combined interviews with the UK Games Fund team, a short survey of Tranzfuser participants, observation of a TAL allocation meeting and social network analysis exercises conducted with a selection of 4 teams. Net mapping generally involves visualising and

making explicit communication flows, as well as those people and things that can help people achieve their goals. In this instance, team members were given coloured blocks and asked to arrange them on a sheet of butcher's paper to represent the contribution of each member from their team and then to draw lines to represent the communication links between them. Participants could arrange blocks and colours as they saw fit but were advised to make a stack for each team member and to use the height of the stack to represent their level of contribution. This helped the teams interviewed reflect on the actual project contributions being made versus their initial perception at the outset.

Supplemented by an open and supportive management style, automated work tracking systems were most useful in terms of work contribution management. Whereas they don't necessarily motivate hard work (Malik and Butt, 2017) and indeed can de-motivate workers if those being watched feel unsafe and lack a sense of ownership, or respect within that process (D'Urso, 2006), nevertheless they provide useful evidence of a problem when issues do arise.

Manual logs enrich the automated tracking documentation, but they are also easy to forget, so it would be helpful to find ways to also make that documentation system as simple and automatic as possible. There is also a lot of value to be gained by sharing those records beyond the immediate business in order to build up a collective knowledge network and potentially also share the costs of machine learning analytics. Co-operative management is key, in collaboration with personal privacy controls.

The blocks on the next page represent the collaboration experience of a team that worked across two businesses. The main recruiter and communicator across both enterprises was a creative manager rather than a coder (who saw building up communication lines between team members as part of their job). This led to a discussion about the distinction between contribution and influence (illustrated in the two different blue spreads, for example). Team goals centred upon gaining a publisher for their demo game and establishing flat team structures long term.
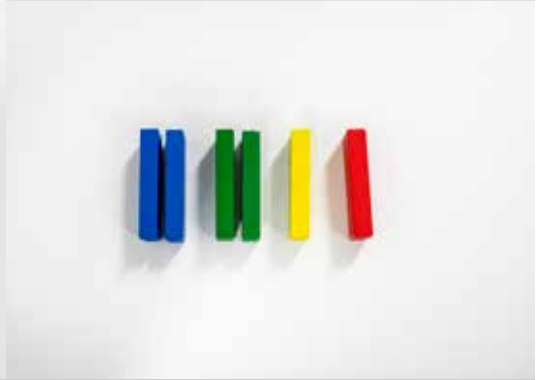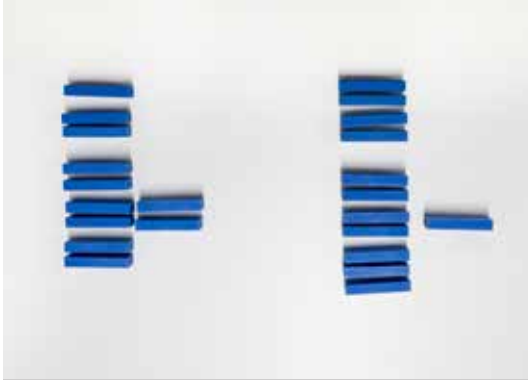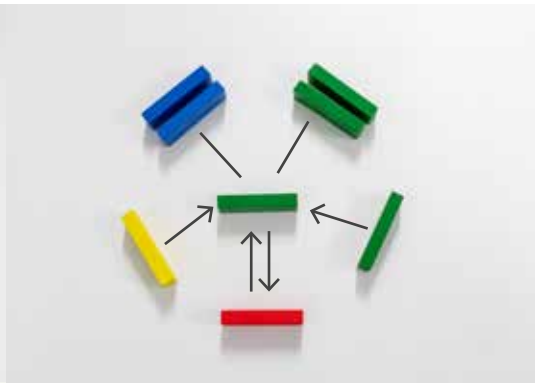
Contribution vs Influence

Key conclusions

1. DATA SHARING technologies such as blockchain and distributed ledger technologies can help to build co-operative knowledge exchange within Scotland's creative industries.

2. IN THE CREATIVE INDUSTRIES these automated tools work best in collaboration with people's own documentation and sharing efforts, not separate to them.

3. GRASS ROOTS NETWORKS provide important support structures in uncertain times.

4. CONSCIOUSLY DESIGNED bridging pathways can enhance cross-sectoral collaborations.

5. DIGITAL DESIGN is a dynamic process that requires lifelong learning. In general, it is advisable that digital skills development programmes are embedded within daily work practice.

6. WHILST EDUCATION IS ABOUT much more than employment, there is also a need for more secure pathways between education and employment within the Creative Industries.

7. FLEXIBLE, PEER TO PEER SERVICES that provide targeted and on demand professional advice are likely to become increasingly important resources for aspiring digital creatives.

8. FOR THE CREATIVE ECONOMY more broadly, flexible IP registration combined with ethical review frameworks might offer a more effective way to encourage innovative collaborations.

9. DIVERSITY INVOLVES building new relationships. Equally, cultural practice takes time to change. Early outreach interventions can provide much needed encouragement for young and non-traditional practitioners.

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