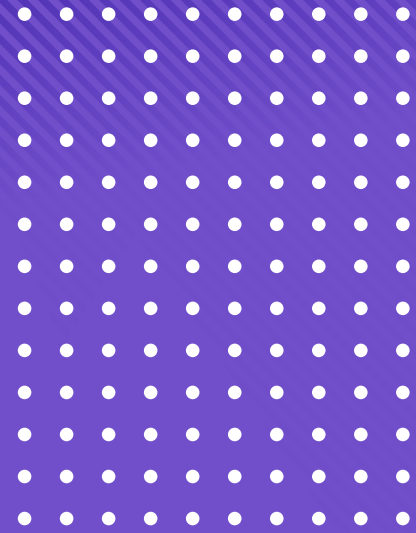


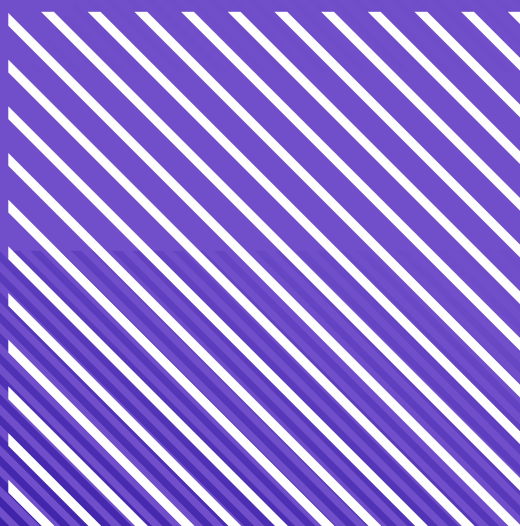
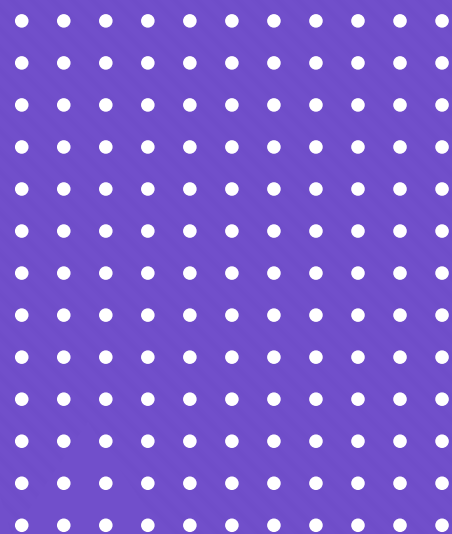
SOUTH WEST
CREATIVE
TECHNOLOGY
NETWORK



Final Report
June 2021

CONTENTS

DIRECTOR'S WELCOME	1
EXECUTIVE SUMMARY	2
INTRODUCTION	3
OUR APPROACH: AN OVERVIEW	7
CULTIVATING CONNECTIVITY	9
THEMATIC COHORTS	11
IMMERSION	13
AUTOMATION	18
DATA	23
THE SWCTN PROGRAMME	27
CREATIVE KNOWLEDGE EXCHANGE	29
CREATIVE PRODUCING	34
INCLUSION	40
BUSINESS DEVELOPMENT	43
RESEARCH & EVALUATION	49
THE FUTURE	62



DIRECTOR'S WELCOME

It's clear by now that technology isn't always the answer to the big challenges of the age: climate, justice and wellbeing. We need tech with values and with purpose. We have supported people and projects who share this spirit of challenge. We may not always have succeeded - this is an ongoing experimental process - but we have tried to foster the emergence of a new wave of technology development.

The network of people we have supported will itself be the lasting legacy of the programme. We start from the principle that diversity of all kinds produces better innovation. We curate and select, mix and match, grow and develop participants who make new connections through encountering social and disciplinary difference. These new relationships will release new forces of innovation right across the region. We have built new innovation capacity by designing a new meshwork of purposeful relationships to push forward future research and development. The universities and producing partners are the pillars of this network: each with their own distinct interests and expertise; each contributing to a mix that becomes greater than the sum of its parts. It's a mix that I like to think has a distinct South West flavour. We've demonstrated that our approach to creative knowledge exchange, whilst rooted in the creative industries, can address research challenges in other sectors - like health, architecture, food production, the green economy and manufacturing.



Photo credit: Jon Aitken

We've also had a lot of fun. This work has to stay creative, playful and experimental. We want our participants to take risks. Though blighted by Covid-19, the face-to-face culture of exchange that our collaborators established in the first half of the programme has served us well. This has been one of the most positive and supportive programmes I have ever had the pleasure of working on. I want to thank the whole team for that. The leadership team, the producers, and the Knowledge Exchange Managers and support teams all signed up for a culture change journey that will achieve more than we yet know. So thanks to you, and to our brilliant participants, for coming together to build the future. I look forward to seeing the new ways we find to work together, to meet new challenges, over the next ten years.

Professor Jon Dovey
Director of SWCTN

EXECUTIVE SUMMARY

SWCTN PRODUCED

75 INNOVATION FELLOWS

24 PROTOTYPE TEAMS

3 PRODUCER FELLOWSHIPS

The people we funded in SWCTN made new and purposeful connections, which have boosted productivity throughout SWCTN and beyond. The new capacities we established were grounded in these connections.

We demonstrated that a creative ecology approach can produce region-wide research and development (R&D) capacity. It gave participants a safe, trusting space for research 'deep dives', gaining confidence with new skills, taking risks, and going in new R&D directions.

We developed creative knowledge exchange as a methodology for linking universities to sites of creative technology innovation. If knowledge is power, knowledge exchange involves sharing power. Creative knowledge exchange is mutual and multi directional, not transitive or linear.

WE LEVERAGED
£7,516,829
IN ADDITIONAL FUNDING
BEYOND THE INITIAL
£4,585,416 INVESTMENT
FROM RESEARCH
ENGLAND.

We implemented the principle that diversity of people, talent and discipline produces better innovation.

We have begun the work of establishing networks of investors for South West businesses who are sympathetic to the aims and growth profiles of the companies we support.

We showed that the impact of the roles of Creative Producers and Knowledge Exchange Managers are central to supporting connectivity in the network, recognising and holding common values.

WE
ESTABLISHED
630
NETWORK MEMBERS
AND 22 NEW BUSINESSES.

We developed a range of business development techniques specific to the needs of small-scale creative technology enterprises, supporting and bridging them where traditional growth models associated with tech start-ups don't work for them.

WE AWARDED
38 BUSINESS
DEVELOPMENT GRANTS
AND **65**
MICROGRANTS.

We developed an ethos that is responsible, inclusive and sustainable for creative technology innovation. This ethos recognises that as a creative technology network we work in an unequal exclusionary domain where the cultural capital we produce does not address or include everyone.

INTRODUCTION

The South West Creative Technology Network (SWCTN) was a £6.6 million research and development (R&D) project to increase collaborative innovations between universities and industry in the use of creative technologies. SWCTN was funded by Research England's Connecting Capabilities Fund, which supports knowledge exchange, commercialisation of products and business growth. SWCTN was a regional partnership between four universities and two creative production studios in the South West UK: UWE Bristol, Bath Spa University, Falmouth University, University of Plymouth, Watershed (Bristol) and Kaleider (Exeter).

Established in 2018, SWCTN supported three creative technology R&D themes through funded cohorts over three years: IMMERSION, AUTOMATION and DATA. SWCTN ran successive sets of fellowships and prototype commissions linked to these themes, alongside microgrant opportunities, mentorship, ongoing knowledge-sharing opportunities and business development support. Our network was made up of 630 members: a rich mix of researchers, artists, technologists, businesses and practitioners from across the region, representing varied disciplines and industries.

“I think it’s been an absolutely brilliant programme. I think the diversity of approaches and opinions and backgrounds has been invaluable.”

Automation Fellow

SWCTN created opportunities for exchange and collaboration to explore the challenges and possibilities of creative technologies. We cultivated a diverse network, prototyped ideas and supported new businesses committed to quadruple bottom line impacts: social, cultural, environmental and economic. Drawing together expertise in creative knowledge exchange (KE), creative producing, business development and creative economy research, SWCTN strengthened regional productivity – generating over £7.5 million of additional income for the region through innovation and creating 22 new businesses. We have built knowledge of environmentally sustainable and inclusive practices to increase business resilience and ethical creative technology development.

The UK was plunged into national lockdown due to the global Covid-19 pandemic in our second year. This had a devastating effect on small creative businesses. The new challenge of delivering the programme online accelerated our team learning around hybrid working, accessibility, and what might be needed in terms of Covid-19 support. We funded new research and created a specific funding call to respond to the challenge.

This report shares our learning and the diversity of impacts that SWCTN has had on building the breadth, connectivity and capacity of the creative technology sector in the South West UK.

“SWCTN was almost its own thing: a hybrid of universities, a hybrid of people, a hybrid of ethnicities, a hybrid of thoughts. It fostered, at least for me, a belonging to a group.”

Data Fellow

NAVIGATION

SECTION 1 - Our Approach: An Overview

Pages 5-10

This section gives an overview of the scope of the Network, and creates a picture of its members, industries and sectors involved, outlining our distinct form of cohort-led R&D programme, and highlighting the types of outputs and impacts we are producing.

SECTION 2 - Our Cohorts

Pages 11-26

This section showcases the R&D conducted in our three thematic cohorts: Immersion, Automation and Data. These sections and the rest of the report are punctuated with case studies that evidence different positive impacts the Network has had on its members, the universities and sectors involved.

SECTION 3 - The SWCTN Programme

Pages 27-48

This section provides the detail of our approach and how we delivered it through our programme of activity and funding calls. We share the benefits and challenges for those considering similar creative R&D or KE programmes.

Creative Knowledge Exchange, pages 29-33, provides the context for SWCTN and university-industry partnerships and sets out our Creative KE principles.

Creative Producing, pages 34-39, shares success and learning of producing for creative technology

R&D and explores the impact of Covid-19 on our programme delivery.

Inclusion, pages 40-42, walks through our journey to build on our inclusion practices to more thoroughly embed inclusion in our thinking, our recruitment, our team and our policies.

Creative Business Development, pages 43-48, provides resources we used to support businesses in SWCTN and our research and learnings on investment and inclusion.

SECTION 4 - Research and Evaluation

Pages 49-61

This section brings together the findings from our surveys, interviews and mapping activities to evidence the success of the connections we created and the diverse outcomes of the cohorts.

SECTION 5 - Creative Technology Futures

Page 62

This section looks at the direction the SWCTN partnership will take into oncoming projects and collaborations, seeking to embed our learning about inclusive, sustainable creative technology and hybrid working models.

HIGHLIGHTS

75

INNOVATION
FELLOWS

24

PROTOTYPE
TEAMS

14

AWARDS

38

BUSINESS
DEVELOPMENT
GRANTS

630
NETWORK
MEMBERS

65

MICROGRANTS

94

PRESENTATIONS
AND WORKSHOPS

3

PRODUCER
FELLOWSHIPS

£7.5
MILLION

IN LEVERAGED
FUNDING

36

EXHIBITIONS AND
PERFORMANCES

11

ACADEMIC
PAPERS

1918

TWITTER
FOLLOWERS

22

NEW
BUSINESSES

10

INDUSTRY
PUBLICATIONS

16

KEYNOTES AND
CHAIRER PANELS

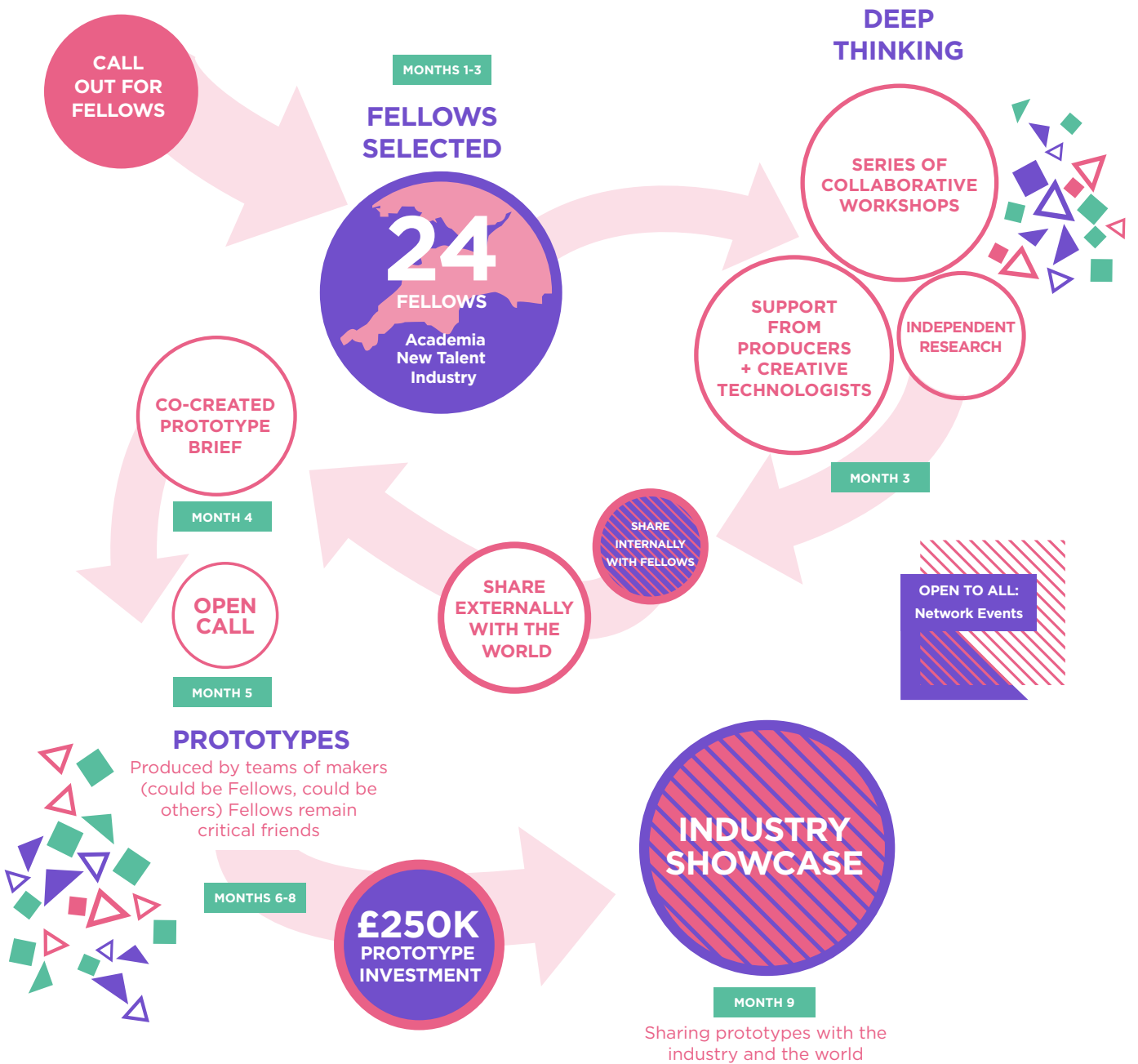
463

INSTAGRAM
FOLLOWERS

190

BLOGS AND
PODCASTS

OUR APPROACH



OUR APPROACH: AN OVERVIEW

The practice of cultural ecology is based on the assumption that diverse groups of people and talents produce more innovative and inclusive outputs. Our job is to facilitate connections, create spaces, and provide support for innovators at all career stages to share experiences, skills and values, to collaborate and co-create.

Creative Knowledge Exchange

A new approach to regional KE that brings together university and non-university R&D with creative technologies to produce innovative new knowledge, skills, products and services.

Creative Producing

A curatorial, intentional and responsive approach to supporting the Network. Producers curate, link, prompt and support personal and project development.

Business Development

Design-led business development tailored to creative micro businesses and SMEs, supporting prototyping teams and wider SWCTN through a business development fund (BDF).

THE THEMATIC COHORTS

Immersion

Building on the potential of existing platforms delivering immersive experiences, from spatialised sound to augmented reality, exploring the role technologies play in reconfiguring spaces, bodies and stories in new and powerful ways.

Automation

Drawing on expertise with automative technologies – artificial intelligence, machine learning, algorithmic coding and robots – to explore the role automation plays in creative practice, through new forms of expression, innovative working practices and new markets.

SWCTN'S PROGRAMME OF ACTIVITIES

Fellowships

Participation in a curated set of collaborative workshops alongside independent R&D time, building sustained and meaningful ideas and relationships across SWCTN and outwards into the region. Exploratory, connective, new.

Prototyping

Businesses respond to a call co-designed by the Fellows. Interdisciplinary and cross-regional teams invited to pitch new products or services. Supported by robust and innovative business models, 'Prototyping the Business' workshop series, and business development advice.

Microgrants

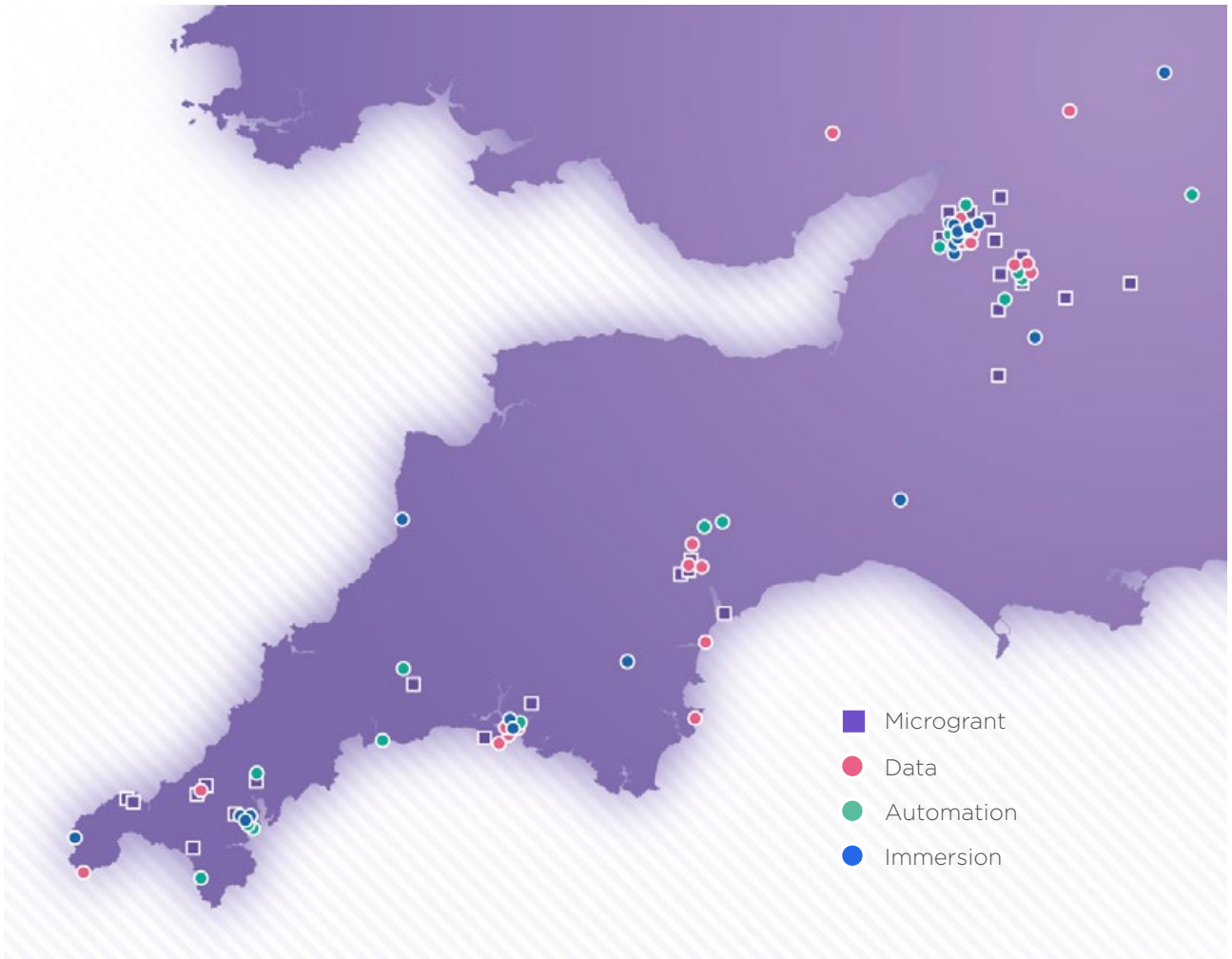
Smaller, devolved funds which allowed SWCTN partners to provide agile, tailored funding, responding to the needs of their local communities. Enabled SWCTN to capitalise on early ideas and to bring more peripheral individuals and businesses into the centre of programmed network activity.

Network Support, Events and Showcases

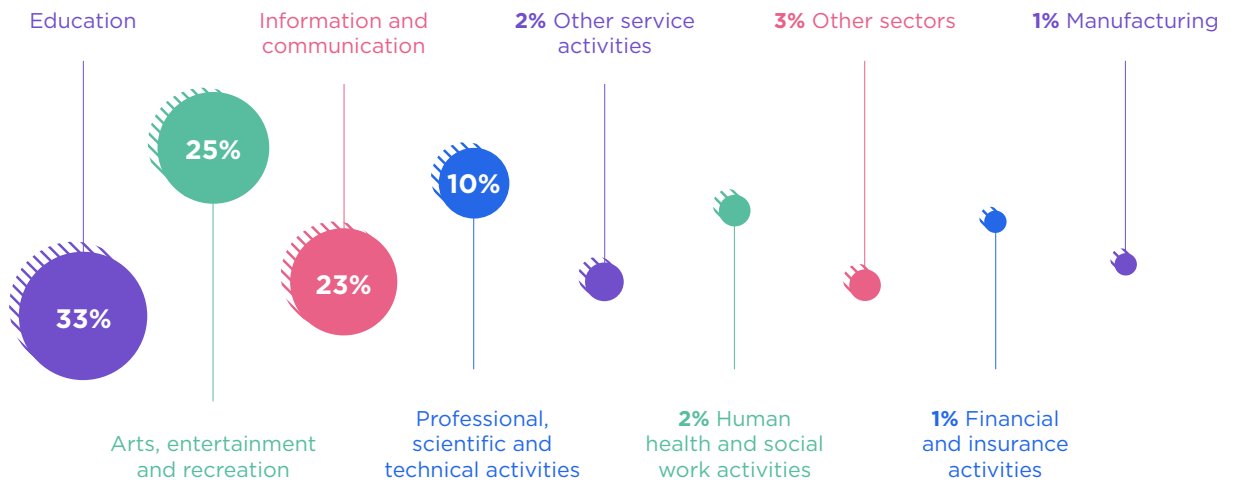
To support, grow and give visibility to SWCTN as a network of individuals and businesses, including annual showcases celebrating the work of Fellows, prototype teams and microgrant holders. Skills and business development delivered through workshops, one-to-one surgeries, panel discussions and networking events.

Data

Creatively exploring how data intersects with our lives and how creative technologies can be capitalised on to expose, resist and create more equitable understandings, forms and uses of data.



INDUSTRIES REPRESENTED IN SWCTN MEMBERSHIP



CULTIVATING CONNECTIVITY

ESTABLISHING A COHORT-LED R&D MODEL

SWCTN created innovative responses to pressing challenges and strengthened regional resilience through a unique approach to R&D, grounded in an understanding and practice of cultural ecology.

By cultural ecology, we mean recognising the interdependencies and value exchange flows between artists, academics, technologists, funders and other network actors who participate in cultural production and innovation¹. Building on a long history of strong networked activity across creative and cultural sectors in the South West, this approach has evolved from longstanding R&D relationships between Watershed and UWE Bristol's Digital Cultures Research Centre (working side by side in the Pervasive Media Studio, a creative technology and cultural hub in Bristol), and more recently Bath Spa University's Centre for Cultural and Creative Industries².

Learning from these past projects, SWCTN put cultural ecology into practice by expanding, strengthening and activating regional networks. Specifically, SWCTN formed a new partnership, connecting Bristol and Bath's expertise in creative R&D with other regional hubs, such as Plymouth's i-DAT Research Lab, Kaleider Studios in Exeter, and Falmouth's Games Academy and Launchpad. By connecting networks between Bristol, Bath, Exeter, Falmouth and Plymouth, SWCTN drew together expertise not only in the creative and digital industries – such as performance, robotics, virtual reality and gaming – but also created opportunities to innovate with other sectors, such as architecture, climate science, health and wellbeing, and manufacturing.

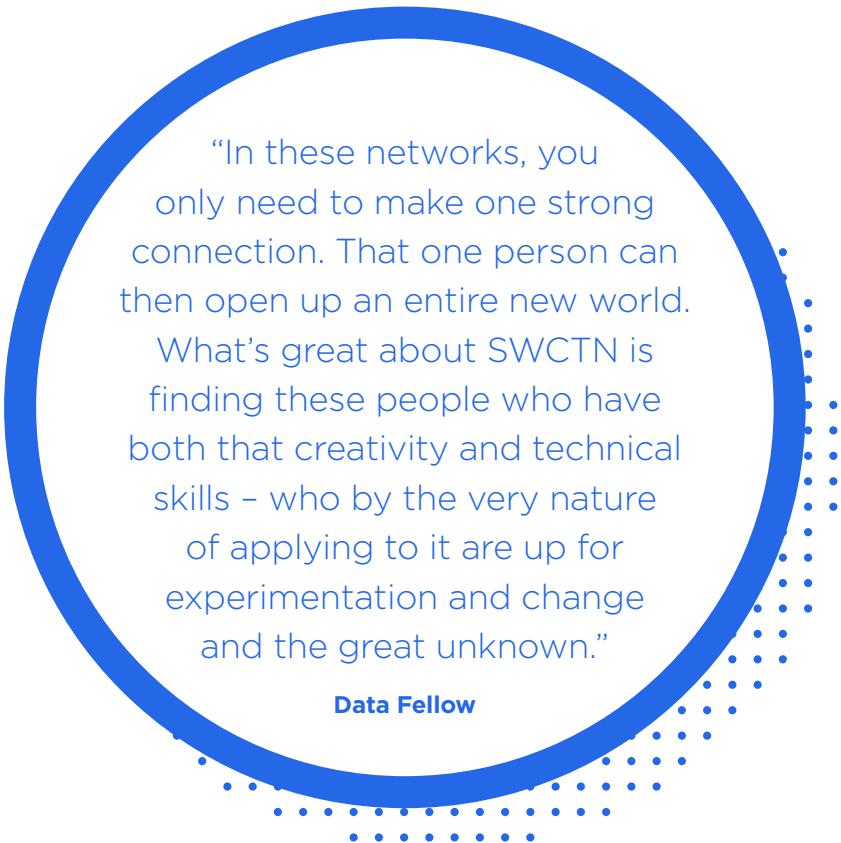


“One thing I hate about the creative industry is how we all operate in little silos, and I think to break those silos down and reach across and meet other creatives making awesome stuff has just been great.”

Immersion Fellow

SWCTN was underpinned by a methodology linking creative production, creative KE and business support, which leverages the power of the creative sector to support value exchange across a rich and diverse regional ecosystem. Our approach not only sparks innovation but also extends the impact of R&D by supporting the development of sustainable business models that are both appropriate for the creative sector and are committed to quadruple bottom line impacts: social, cultural, environmental and economic.

In designing our SWCTN programme, we very deliberately split our funding into research fellowships (thinkers) and prototype teams (makers), together forming thematic cohorts. This distinction allowed different kinds of talent to access our funding, and different kinds of development to take place, with different values in play. The cohorts were curated as inspired by Watershed's Pervasive Media Studio residency model, operating on terms of generosity, interruptibility and experimentation³.



“In these networks, you only need to make one strong connection. That one person can then open up an entire new world. What’s great about SWCTN is finding these people who have both that creativity and technical skills – who by the very nature of applying to it are up for experimentation and change and the great unknown.”

Data Fellow

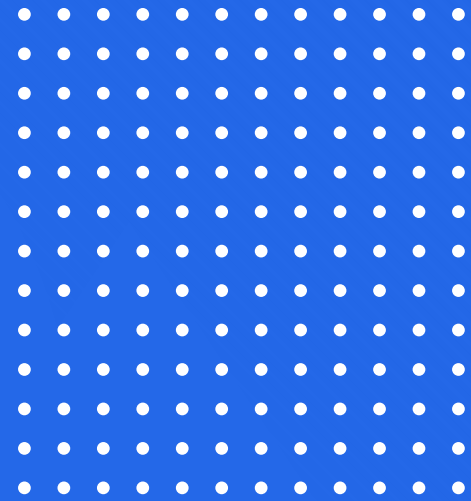
The distinct strengths of SWCTN partners enabled a vibrant mix of academic, industry and new talent to come together as cohorts, and the thematic focus around ‘matters of concern’ allowed for disciplinary specialisms to meet in the middle with enough overlap to result in genuinely interdisciplinary outcomes. The collaborative, thematic cohorts acted as the ignition to drive Network activity and lay the groundwork for collaboration and innovation, with many of our Fellows going on to success with the competitive calls for microgrants, business development funding (BDF) and prototype funding. The prototype funding calls were co-designed with our Fellows. This enabled us to embed the shared learnings and values of our Fellows into the commissioning process and fund businesses to deliver prototypes that responded to gaps in the regional R&D base. We recruited eight prototype teams in each of the three thematic cohorts. Each cohort shared their R&D with the public and investors at an end-of-year showcase.

Knowledge Exchange Managers were central to linking the cohort activity to other activity within the partner universities and local industries. They also worked to create the conditions for local and regional innovation within the programme as well as ensuring that individual fellows and ideas could flourish.

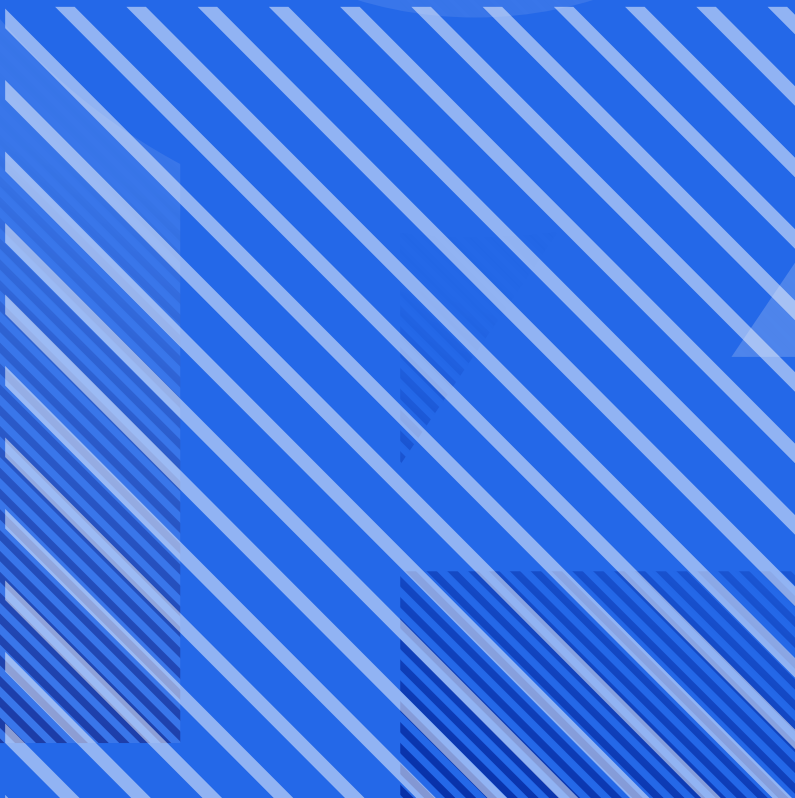
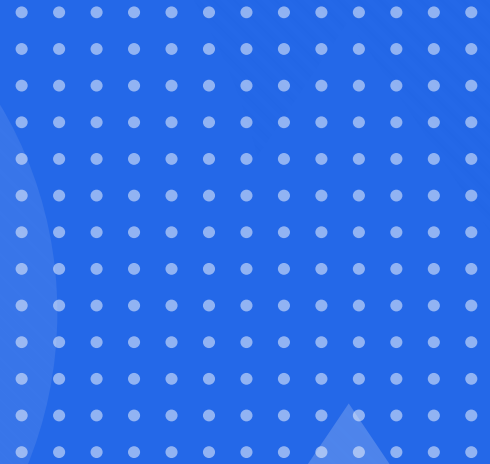
Our business development ensured those ideas translated into businesses, products and services. Truly interdisciplinary, thematic and cohort-led business development programmes are not a KE model commonly associated with universities, being less linear and with a broader understanding of the value of different forms of output, and requiring outside expertise for delivery. We actively encouraged deep thinking, exploration, serendipity and play. The value in our approach is evidenced in the following report through case studies, which highlight the resulting wealth of outputs and further funding that SWCTN has delivered. Our cohort-led approach has created genuinely bottom-up, cross-regional collaborations. It has put trust at the core of our funding and put focus on creativity and collaboration as well as outputs. We illustrate how creative KE is multidirectional and facilitated through the creation of conditions for individuals to take advantage of serendipitous encounters and connections.

1. Dovey, Jonathan, Simon Moreton, Sarah Sparke, and Bill Sharpe. 2016. 'The Practice of Cultural Ecology: Network Connectivity in the Creative Economy'. *Cultural Trends* 25 (2): 87-103. tinyurl.com/34c92u9s
2. Graham Leicester, and Bill Sharpe. 2010. 'Producing the Future: Understanding Watershed's Role in Ecosystems of Cultural Innovation'. *International Futures Forum*. tinyurl.com/23bpnad4
3. REACT was a UKRI-funded Knowledge Exchange project between 2012 and 2016, involving several SWCTN partner organisations and team members. Read the final report: tinyurl.com/487vxrj4

OUR COHORTS



“I think the biggest thing I learned was that I know my subject. It’s given me confidence, academically and as a practitioner. It quelled, a little bit, the imposter syndrome. The fellowship has given me a career step up in terms of academia and how my university sees me.”



IMMERSION

From spatialised sound to augmented reality, emerging immersive technologies give developers, creatives and performers new ways to blend physical and virtual worlds. The first cohort of fellows and prototype teams focused on the theme of Immersion. Immersion Fellows drew on experience across the creative industries and digital sectors, from conservation filmmaking and sound performance to projection mapping and haptic technologies. Our goal was to build on the potential of existing platforms, delivering immersive experiences by enabling bold, interdisciplinary thinking around future content, tools, services and applications.

Immersion Fellows challenged the claim that immersive technology equals immersion. As experts in theatre, dance, fine art, cinema, gaming, music and literature, many Fellows explored the role technologies could play in reconfiguring spaces, bodies, and stories in new and powerful ways. Immersive technologies such as virtual reality and 3D film do not necessarily create immersive cultural experiences but can add value to its existing forms and generate novel experiences. The cohort visited the Immersive Vision Theatre at Plymouth University's i-DAT⁴, which influenced the group's thinking around immersive spaces beyond the headset – such as full dome projections. This inspired Immersion Fellows Harry Willmott, Nwando Ebizie and Neil Harris to consider the opportunities and limitations of this technology within their fellowships. Mike Phillips, SWCTN academic and Director of i-DAT, then led a team of five Fellows to the IX Symposium in Montreal on the theme of Immersion: Digital Immersive Cultural Experiences.

Building on these discussions, Fellows explored how other sectors would benefit from engaging with creative technologies to tell better stories, ensure ethical use, and create more collective experiences when using immersive technologies. For example, Exeter-based Fellow Louisa Adjoa Parker worked with rural Black and ethnic minority communities to tell stories of marginalised voices in the South West, using creative technologies to support empathy and shifts in attitude in the wider community. Prototype team VIKA books used augmented reality, video and audio to create Baby BSL, an interactive illustrated children's pop-up storybook and communications aid. They have been nominated for 18 business and technology awards and have been named in the Creative Industries Council 'CreaTech Top 100 Ones to Watch'.



Photo credit: Jon Aitken

4. www.i-dat.org/ivt



Ice Road, Photo credit: Jack Offord

CASE STUDY SHARON CLARK

ACADEMIC FELLOW AND BUSINESS DEVELOPMENT FUNDING RECIPIENT

Sharon explored how creative digital technology might deliver anticipation and recall for an audience in an immersive theatre narrative. Through her theatre company, Raucous, Sharon has long experimented with creative technologies in theatre:

“Because, as a playwright, it gives me a massive toolbox by which I can tell stories in totally different ways, and by which I can whisper in your ear. I can make you weep much more readily in immersion than I can with an audience. Heightened emotional response, for me, is visceral and vital as a playwright.”

Sharon’s fellowship enabled her to develop relationships with technologists and deepen her understanding of immersive technologies. Discussing complex technologies with peers helped alleviate some of the fear surrounding them. Sharon collaborated with Immersion Fellow and creative technologist Coral Manton on Raucous’ next immersive theatre production, *The Undrowned*.

“Coral and I have a very open and equitable knowledge exchange system between us,” Sharon says. “We support each other, and we believe in each other’s visions. I think we really do want to be on the journey together, being seen as a couple of women who make beautiful work.”

Building on SWCTN research, Sharon was awarded a fellowship with Magic Leap and the Royal Shakespeare Company (RSC) to work with other Fellows to create an immersive interpretation of *A Midsummer Night’s Dream*. The work, and associated research, has been presented internationally, including at South by Southwest (SXSW) in Texas and the RSC in Stratford-upon-Avon.

Although the fellowship proved challenging in balancing the demands of academic and practitioner roles, the experience has bolstered Sharon’s confidence as a practice-based researcher and made her expertise much more legible to academic audiences:

“I think the biggest thing I learned was that I know my subject. It’s given me confidence, academically and as a practitioner. It quelled, a little bit, the imposter syndrome. The fellowship has given me a career step up in terms of academia and how my university sees me.”



CASE STUDY

MITCH TURNBULL

INDUSTRY FELLOW, PROTOTYPING AND BUSINESS DEVELOPMENT FUNDING RECIPIENT

Award-winning conservation and wildlife filmmaker Mitch Turnbull explored how immersive technology can influence opinion and change behaviour in conservation and humanitarian advocacy. To explore this, Mitch surveyed audiences at the Saatchi Gallery, London, learned from sound ecologists and virtual reality experts, and worked with academics. She realised the potential impacts could be huge:

“When I first came across immersive technology in 2015, I realised its potential in terms of its power to engage people. In an immersive experience, you have the capacity to create a really deeply meditative thing. You also, on the other end of the spectrum, have the capacity to have something incredibly visceral that’s actually painful to experience.”

This raised the question of the ethical responsibilities immersive artists and content creators have to their audiences.

Mitch successfully received SWCTN prototype funding for the project EarthSongs, a beguiling interactive audio-visual mixed reality app that explored natural soundscapes through play, experimentation and creation⁵. Designed for Magic Leap, an augmented reality platform, unique sounds from nature are represented by beautiful, visual interactive motifs. Players discover different natural

habitats as well as different ways to interact and play with natural sounds, even recording their own. Mitch collaborated with All Seeing Eye, a Gloucestershire-based creative technology firm, to develop EarthSongs. Immersion Fellow Luke Reed led the sound design and implementation.

Mitch has presented the work globally, including at Creative XR Showcase, Simple Things Festival in Bristol, Tate Exchange, i-Docs, EarthXFilm Festival, Forest of Imagination festival, Timber Festival and NYC Climate Week. Over 250 people tested the EarthSongs prototype at Sundance Film Festival, across four public showcases, where it received overwhelmingly positive feedback. Recently, the project was honoured with an ‘Official Selection’ at the blue chip wildlife film festival, Wildscreen.

While developing the prototype, Mitch reactivated her company Bramble Media, with support from SWCTN’s Business Development Advisor. Bramble Media has since developed a large-scale projection experience of EarthSongs, carried out test projections, and is exploring dome projection. Mitch gained significant new contacts to explore collaborations with the British Library, Philharmonia Orchestra, Real Ideas Organisation, Eden Project and Arts Council England.

5. www.swctn.org.uk/immersion/prototypes/earth-songs

IMMERSION PROTOTYPE TEAMS

AUDIOWAVE BY SQUIDSOUP

www.squidsoup.org

The AudioWAVE prototype is a modular, scalable decentralised system of devices that act as an ecosystem of many hundreds of tiny computers, working together to create an immersive and visceral flow, which carries audio and light through space.

BABY BSL BY VIKA BOOKS

www.babybsl.com

An augmented reality storytelling app to delight and motivate parents and carers to use British Sign Language to interact and communicate with pre-verbal and non-verbal children.

EARTHSONGS BY MITCH TURNBULL

www.bramblemedia.co.uk

An interactive audio-visual mixed reality app, highlighting the beauty and importance of sounds in nature to our wellbeing and cultural heritage through play and experimentation.

REALTIME STAGEMAKER TOOLKIT BY ANAGRAM

www.weareanagram.co.uk

A toolkit to aid creative collaboration for designing virtual reality experiences. It uses a plug-in to help democratise the Unity platform and make it more accessible to non-technical sectors like theatre.

RENAISSANCE BY BEN DUNKS

www.renaissancemsp.com

A movement programme for older people at risk of falls. It uses motion capture technology to measure the improvements achieved through taking part.

SHARED PASTS: DECODING COMPLEXITY BY CORAL MANTON

www.coralmanton.com

An augmented reality technology project to reveal layers of narratives in historic artefacts and places. The project highlighted how meaning-making is dependent on the lens through which you see the past.

TACTILES BY ROWAN JAMES AND DR NICK INOUE

www.beatblocks.co.uk

TacTiles was a partnership with SubStrike, which allowed bass-rich music to be felt by diverse audiences. It captivated people's sense of touch, enabling an entirely new form of artistic expression: the haptic DJ. The underlying technology is now being taken forward by new team.

TECHNIE ACCELERATION TOOLS BY TRIANGULAR PIXELS

www.triangularpixels.com

This innovative tool helps developers make virtual reality content more accessible to disabled and non-disabled users. Responsive content generation tools mean that games adapt to players and their space rather than players having to adapt to games.



AUTOMATION

Artificial intelligence, machine learning, algorithmic coding and robots are some of the ways automation has changed the way we live, impacting all parts of society. These emerging technologies offer the creative industries new ways to create, engage audiences and build bridges across disciplines.

Our Automation Fellows drew on their diversity of experience and expertise with automative technologies to wrestle with the role automation plays in creative practices. At their best, these technologies can enable new forms of expression, transform working practices and create new markets. Industry Fellow Tariq Rashid investigated these opportunities when planning the exhibition *Algorithmic Art* at the Royal Cornwall Museum, which explored how “the speed and untiring precision of a computer opens up creative opportunities not possible with a human hand”.

However, these technologies come with risks, potentially threatening and displacing certain kinds of work. One prototype team - The Collaborative Construction Platform - focused on the opportunities for automation in the construction sector, to switch the automation model from one of replacing and reducing human workers, to one which can preserve and work with skilled human workers and create new kinds of jobs within the construction industry. Their pragmatic approach developed technology that sought to empower workers by ensuring traditional skills and techniques are sustained and enhanced within automated construction methods.

Another critical theme to emerge focused on the ‘black box’ of automative technologies⁶, seeking to shed light on its opaque inner workings. Numerous fellows explored how our biases are encoded into the algorithms we create, potentially worsening inequality and marginalisation. Through practice-based research, fellows sought more equitable outcomes by democratising automative technologies through public workshops. For example, New Talent Fellow Ruby Jennings developed soft robotics workshops for children, inspired following a visit to the Bristol Robotics Laboratory, hosted at UWE Bristol. Fellows Ellie Foreman, Rachel Smith and Rosie Brave conducted user design workshops to co-create aspects of their fellowships.



Robot with gripping end of arm tools using computer vision to grasp objects (Research & Innovation Festival 2020, University of Plymouth)

With many automation technologies still in their infancy, unleashing their potential to serve society will require continued collaboration and critical thinking. Many of these themes and ideas are unpacked further by Automation Fellows in the book *Unboxing the Black Box: Reflections on Making with AI and Automation?*; Fellows Mollie Claypool and Patrick Crogan also built upon these themes in an upcoming co-edited book *Creativity in the Automatic Society*. Our Automation cohort showcase creative technologies’ uses across multiple sectors.

6. ‘Black box’ refers to the way that the internal mechanisms and programming biases of much technology are deliberately hidden from the user.

7. www.swctn.org.uk/automation

CASE STUDY TOM DUGGAN &

INDUSTRY FELLOW

ALEJANDRO VELIZ REYES

ACADEMIC FELLOW

Another successful collaboration formed around Tom and Alejandro's exploration of 3D clay printing. Their process was characterised by playful experimentation with technology, rather than defined by any particular discipline. Instead of focusing on the final product, Alejandro captured their collaborative ethos as: "Let's see what we can get out of this system."

An open-ended approach to innovation and a rich shared network allowed them to draw in other stakeholders that complemented Tom and Alejandro's respective expertise in automated fabrication techniques and sculpture, and material science and programming. This led to a collaboration with KUKA Robotics, Imerys and the University of Plymouth to build and optimise an additive printing process of sustainable, locally sourced materials.

Both Fellows went on to win further funding to continue their interdisciplinary research. At the University of Plymouth, Alejandro has participated in the development of a new Digital Fabrication Laboratory, started a mobile robotics research group supported by provision of robotic arms from Epson Robotic Solutions (based in Germany) and published his research⁸.

Tom produced work for the Alchemy in Art exhibition at Tate St Ives, which attracted over 2,500 people and raised questions regarding the sustainability of resources. Winning funding from Aerospace Cornwall, who recognised that "with their unique perspectives, artists add real value to the research and development process", led to a profile in national magazine Breakthrough⁹.

As a result of their inclusive approach to innovation, their work impacted a wide range of sectors including arts and engineering, which diversifies revenue sources and potentially creates a more sustainable approach to R&D. For Tom, SWCTN has increased his connection with universities, while for



Human-Robot interaction for the production of creative outputs



Robotic reproduction of human sketches through in-house developed contouring, computer vision and trajectory planning software

Alejandro SWCTN itself has created valuable connections. Tom says:

“Working with Alejandro opened up a lot of possibility to develop some of the ideas I've had but just haven't had the resources or the time to achieve. There's constantly new partnerships, new development, new opportunities and projects.”

8. Alejandro Veliz Reyes, Wassim Jabi, Mohamed Gomaa, Aikaterini Chatzivasileiadi, Lina Ahmad and Nicholas Mario Wardhana. 2019. "Negotiated Matter: A Robotic Exploration of Craft-Driven Innovation", *Architectural Science Review*. 62:5, 398-408, DOI: 10.1080/00038628.2019.1651688
9. The United Kingdom Science Park Association. 2019. 'The Art of Space'. Breakthrough, Summer 2019. [issuu.com/open-box/docs/ukspa_issue_8_hi-res/30](https://www.ukspa.com/open-box/docs/ukspa_issue_8_hi-res/30)

THE

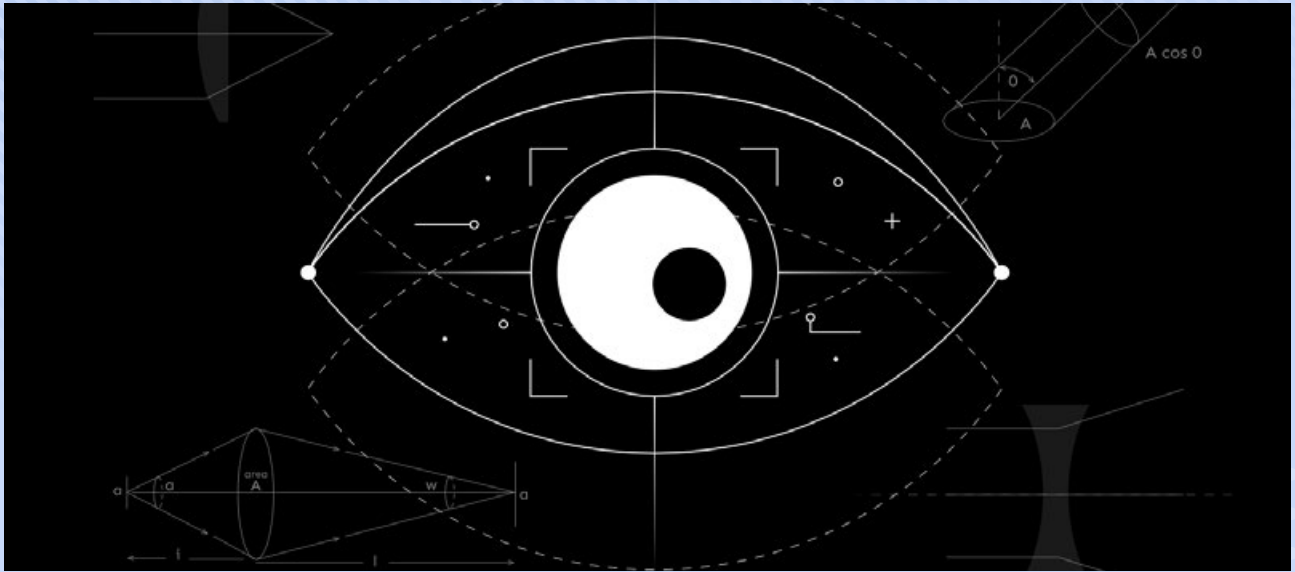
AUTOMATED ART

MOVEMENT



An End to the tyranny of the factory floor and a return to cottage industry. Anarchy and automation in the UK. Art for the many not the few.

EF
GND
13
12
11
10
9
8
7



CASE STUDY

STEPHANIE CAMPBELL

AUTOMATION INDUSTRY FELLOW

Bristol-based Stephanie founded Okko Health to improve eye disease patients' ability to get medical care at the point that it is most needed. Stephanie's team created an app that allows patients to test their eyes through weekly games and visualises the results, giving them confidence to monitor their own eye health and book earlier appointments.

Stephanie entered the fellowship with a basic prototype and believed her research would be data driven – to improve the app and the information the NHS needed. Through the fellowship she began incorporating a more holistic and patient-centred approach to the app, with more focus on user co-design workshops and interviews with patients to find out what they wanted from the app, and what would drive them to use it. It clarified in her thinking that AI should be used to improve efficiency rather than to replace human contact, freeing up more time for human-centred approaches to healthcare. Stephanie began to think of it as a companion app, which became its unique selling point. This directly resulted from the ethical discussion the cohort was having about AI:

“They made us think differently. The artists had a different perspective. And they would ask really deep questions and then they'd go down the rabbit holes. And I think that was the thing I really learned from SWCTN: when we were doing user-led design, it's okay to dive down the rabbit holes.”

SWCTN enabled Stephanie to reduce her working hours and concentrate more time on the business. She was able to switch to a new specialism and learned about predictive medicine in an eyecare context. She spent time with patients and doctors to understand exactly what they each needed, and what would connect them together.

Okko Health won further funding for development from Bayer AG, members of the UK Angel Investment Network, Innovate UK, and mentorship from Creative Destruction Lab. Stephanie took on eight staff members and continues clinical and user testing with two UK hospitals. Her TEDx Bristol talk was viewed by over 3,000 people. Plans for the app include a children's version, linking app data into the NHS directly, and linking mental health aspects to eye health.

AUTOMATION PROTOTYPE TEAMS

AIM (AGROECOLOGICAL INFORMATION MODEL) BY COMPLEX EARTH

www.complexeearth.co.uk

An intelligent software tool for automating the design and ongoing management of agroecological food systems. AIM will allow city authorities to implement urban food production on a large scale.

AIR GIANTS BY EMMA POWELL, RICHARD SEWELL, ROBERT NIXDORF, JAZLYN PINCKNEY AND ANDREW BACHELOR

www.airgiants.co.uk

With towering tortoises and pneumatics newts, this project brings a sense of joy and wonder to large audiences using large-scale soft robotics. Air Giants can form part of installations, street performance, stadiums shows or festivals.

LOOKING FOR THE CLOUD BY THE RE+ COLLECTIVE

www.swctn.org.uk/automation/prototypes/looking-for-the-cloud

An interactive audio-visual mixed reality app, this prototype explored sustainability and diversity in our relationships with new technologies. In collaboration with the Eden Project, Re+ Collective created a children's book, augmented with a proof-of-concept chatbot.

PLAYABLE PLACES FOR URBAN SPACES BY LITTLE LOST ROBOT CIC

<https://lostrobot.org>

Little Lost Robot used soft robotics to create automated, versatile street furniture providing more inclusive and welcoming public urban spaces. Benches fold and unfold, give shade, collect rainwater and host vertical gardens.

ROOM READER BY BEECH DESIGN, YETI TOOL AND REPRAP LTD

www.beechdesign.co.uk

Room Reader takes thousands of measurements – using a line generator and a number of cameras – stitching them together to create a 3D model. The model is compatible with widely used CAD systems, bringing more affordable laser scanning to a larger audience.

THE COLLABORATIVE CONSTRUCTION PLATFORM BY AUTOMATED ARCHITECTURE

www.automatedarchitecture.io

The prototype utilises augmented reality and industrial robots to create a platform, enabling opportunities for new kinds of jobs in construction, upskilling to contribute to growing technological change, and localised investment in digital tools.

WEATHER REPORT BY STUDIO MEINECK

www.studiomeineck.com

This physical and digital tool was co-designed with men aged 35-55 to help express and monitor inner weather as a visual metaphor for mental health and wellbeing. It uses machine learning to reveal patterns over time that are difficult to see in times of distress.

XPLOREDEN BY DATA DUOPOLY

www.dataduopoly.com

Data Duopoly are a female-founded start-up, on a mission to revolutionise the visitor experience in any venue worldwide. Their platform allows venues to better understand customer behaviour, optimise visitor distribution on-site and increase on-site revenue.

DATA

Data is powerful matter: it can be extracted and abstracted from almost anything and anywhere. When aggregated and contextualised, data increasingly governs the ways in which we construct information and generate claims about knowledge. Spun in multiple ways, it reveals patterns that can provide insight and enable change, monitor behaviours, as well as control, regulate, reproduce existing inequalities, and suppress actions.

Our Data Fellows' research unfolded against the first wave of the Covid-19 pandemic, resulting in a global debate on health data. Issues relating to contact tracing and virus profiling came to the fore, as questions around data security, including who collects data, where and how it is stored, and with whom it is shared, became everyday topics. Health data confirmed that Covid-19 was disproportionately affecting Black and ethnic minority communities; deep and challenging thinking about inclusion, data bias and ethics was central to many of the discussions across the fellowship.

The first lockdown forced us to shift our Fellows' workshop programme online. We learned a lot from this process, and working online together emphasised the value of connection, inclusion and iteration in virtual work. Despite having never physically met, Fellows continued to collaborate. They created a Data Zine¹⁰ to explore some of the more playful and creative ways they were thinking about data, led by Industry Fellow Corinne Stewart, an engineer who hadn't previously used creative approaches in her work. Four of the Fellows, Alex Hilson, Natasha Nicholson, Pete Quinn Davis, and led by Annie Legge, created sensewithData¹¹, a website which seeks to start a discussion about how digital data affects communities and can become a force for change.

Research interests around data were very broad: Grace Quantock looked at how creative technologists can think about trauma-informed delivery of data to their clients and user groups; Hannah Little explored how we can increase awareness, individual rights and advocacy around data. Audio-visual artist Kathy Hinde researched water data, exploring rewilding and non-anthropocentric approaches to data and creating a number of deep listening river walks. Matthew Sargeant looked at the objecthood of music in the age of big data.



The Data Fellows were key to making inclusion and climate change central to our ensuing Data prototype funding call. This generated some groundbreaking new businesses looking at data bias in marketing and inclusive data unions; new green economy ideas focussed on the circular economy, city cargo bikes and rewilding with trees and bees.

10. www.swctn.org.uk/data

11. www.sensewithdata.org



Photo credit: Eight Agency

CASE STUDY TRACEY BOWEN

NEW TALENT FELLOW AND PROTOTYPING

Tracey Bowen is a Mercury Music Prize winning artist and a creative technologist and producer. She joined SWCTN first as a Data Fellow and then as the lead of a Data prototype team.

She says: “I had no idea at the start of this journey that I would be afforded so many opportunities and benefit so significantly – the effects have been transformative and life changing.”

Her prototype, Controlr¹², is a decentralised data union with a difference. The project sought to redress the unequal power balance between data providers and big tech by enabling users to earn revenue from the data they produce.

The project also aimed to counter inequity within tech and its development processes, where marginalised people are usually an afterthought in new product development. A large proportion of the lead or consultancy roles within the project were filled by Black women. Equality is an important aim for Controlr and aligns with the prototype team’s mission to create equitable futures for all. Crucially, Controlr also focussed on testing new governance models by adopting a decentralised,

cooperative structure. The prototype is innovative in its tech, but also in the way it is being built and run.

Despite the pandemic, SWCTN opened up multiple connections and inspirations to Tracey, which took her in unexpected directions. She set up Black Eco Republic¹³, a Black-led organisation created to increase the level of participation in underrepresented communities in relation to climate change action and debate. She became one of the first RadicalXchange Fellows, building on her model of data unions. Tracey was also awarded a Mozilla Creative Media Award to create an immersive experience about bias and racial justice in AI.

“To finally be able to realise the vision of creating tech with marginalised people in real focus has been humbling. The fact that we can also realise the start of a movement to democratise technology and data is thrilling. Over the next five years I envisage the landscape of the South West changing rapidly beyond all recognition. The widespread use of cryptocurrencies and the normalisation of data autonomy and literacy will see the beginnings of a proactive motivated population who are well informed about their choices and act on them.”

¹² www.controlrapp.com
¹³ www.theblackecorepublic.com



Photo credit: Eight Agency

CASE STUDY

POLLENIZE

PLYMOUTH MICROGRANT AND PROTOTYPING

Pollenize CIC is a Plymouth-based social enterprise who connected with SWCTN first through a microgrant from the University of Plymouth. The team comprises environmental scientist Matthew Elmes, technology lead Martin Howitt and data lead Lucy Knight.

Pollenize have a network of beehives across the city of Plymouth, located on iconic, historical buildings. Working with the B4 project, these are connected to hives in Devon and Cornwall. such as the Eden Project and the Lost Gardens of Heligan. They used their microgrant to build an off-grid solar- and battery-powered remote sensing module, consisting of hive scales and webcams with a 4G/wifi channel for real-time broadcasting from a Raspberry Pi platform. This enabled them to engage the public and integrate footage with their seed map.

From this, Pollenize raised further money through a crowdfunding campaign to give away a packet of seeds to every child in Plymouth. This early-stage funding success meant they were able to go on to bid for prototype funding. Their prototype sought to

gather environmental intelligence data to research and combat the drivers of insect decline through understanding what the bees were eating at different locations to deliver public-led rewilding solutions using the honeybee as a vehicle to green recovery. The team say that bees make “incredible biosensors” and using AI cameras and algorithms means they may be able to “detect and decode the ‘waggle dance’ - which is the bees’ method of communicating the location of forage to each other”.

This project created a public facing mapping tool and content management system to communicate and visualise the data streams collected from the hives, as well as provide a platform to collect seed sowing location data from the public. The team joined forces with musician Simon Dobson to bring a creative engagement into the project through hive-inspired music - with the bees themselves becoming the musicians through the data stream they create. This enabled the team to attract new audiences to engage with nature and environmental issues by first tuning into their local beehive.

DATA PROTOTYPE TEAMS

BE MORE CIRCULAR BY BROKEN CIRCLES

www.bemorecircular.org

A data visualisation tool that reveals the true and hidden costs of materials, manufacture, usage and end-of-life costs of household products, to empower consumers to make informed choices.

CONTROLR BY CONTROLR

www.controlrapp.com

A decentralised data union which allows users to earn revenue from the data they produce. The project seeks to redress the unequal power balance between those that provide data and those that profit from it.

DATA CARGO BY DATA CARGO

www.thedata.place

The Data Place Ltd and Bikespace CIC, two social enterprises based in Plymouth, have collaborated to trial electric cargo bikes to speed up and 'green up' local goods deliveries in Plymouth, bolstered by data products informed by sensors on the bikes.

IN THE LOOP BY IN THE LOOP

www.cornwall365.org.uk

A flexible data collection and analytics platform to create better feedback loops between audiences and cultural producers, and meaningful stories of impact in rural contexts.

I BY THE SOCIAL DETAIL

www.thesocialdetail.com

I uses machine learning to evaluate language and images in marketing content to identify negative bias. By highlighting sexist, racist or ableist blindspots, it makes it easier for marketers to reach their inclusion goals.

MINDFLOW BY MINDFLOW

www.swctn.org.uk/data/prototypes/mindflow

A personalised wearable system designed to provide the user with calming, restorative audio and tactile experiences through an innovative use of their real-time physiological data.



Photo credit: Eight Agency

POLLENIZE BY POLLENIZE

www.pollenize.org.uk

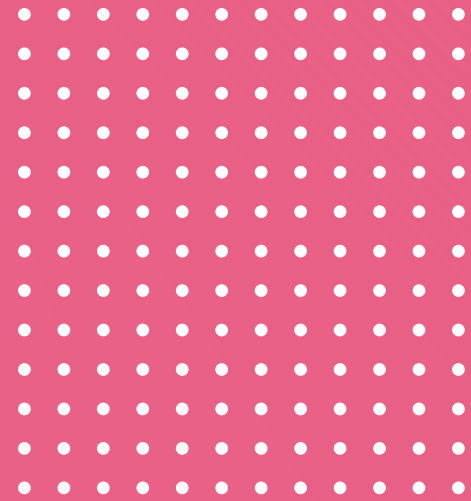
Pollenize gathers environmental intelligence data to research and combat the drivers of insect decline and deliver public-led rewilding solutions using the honeybee as a vehicle to green recovery.

VANA BY VANA

www.projectvana.org

Vana's afforestation-with-data app aggregates available data (including HM Land Registry, Companies House, West of England Nature Partnership, the Forestry Commission and TISCReport) to identify ways to increase tree coverage and engender corporate climate activism.

THE SWCTN PROGRAMME



“SWCTN was a nice place where you could explore and have a creative little bubble to step into and I really would like to replicate that in the MSc that I’m setting up, just for the students, because they do not have that safe space to explore.”



CREATIVE KNOWLEDGE EXCHANGE

Over the course of SWCTN we have refined a distinct form of creative Knowledge Exchange (KE). Our creative KE model operates within an understanding of cultural ecologies and works in close combination with creative producing and business development to support networks to build connectivity and collaborations. A term most commonly used within academia, KE refers to mechanisms for extending the impacts of university research by sharing knowledge with non-academic sectors.

As the financial models of universities have changed, universities have been required to evidence their impact outside of academia. This led to a drive for Knowledge Transfer (KT), the transfer of knowledge from within the university out into practical applications in the world. KT presumed innovation primarily happens by commercialising university intellectual property (IP), spinning out new companies, university-led consultancy, and 'disrupting' industries through new tools or practices. By and large, these are still dominant models of university KE strategies. KE is, however, increasingly understood as universities' "role in bringing together public, private and third sector organisations into a wider KE ecosystem"¹⁴.

KE might be understood as enabling and empowering creative and collaborative activities that help the world to benefit from research and expert knowledge. Our distinct creative KE takes the starting point that innovation happens in the emergent creative collaborations – the points of connectivity – that happen between academic and non-academic participants within SWCTN and others in the region, facilitated by the programmes we offered.

Each university partner supported creative KE through dedicated Knowledge Exchange Managers, who had the remit to work one-to-one with network members to:

- increase the impact of the members' research locally and regionally
- work with the creative producers in supporting programme delivery
- support network members with applications for further funding

- facilitate connections between network members and university researchers and resources.

Our KE team consisted of Rachel Pownall (Bath Spa University), Tom Edie (University of Plymouth), Adam Stringer and Lloyd Brina (Falmouth University), and Tom Trewhella and Melissa Blackburn (UWE Bristol).

Throughout the project, we have worked to build awareness of KE as a concept in the creative technology sector. Often KE is focused around capitalising on a university's core research disciplines, particularly STEM subjects (science, technology, engineering and mathematics), whereas SWCTN was built around the interdisciplinary creative technology sector, which comprises smaller creative businesses and freelancers who have lower levels of experience working in formal partnerships with universities than larger organisations might have. Awareness of KE as a concept and its benefits to members was something we wanted to improve.

KNOWLEDGE EXCHANGE MANAGERS

Before the Covid-19 lockdown, KE managers were able to link SWCTN members with relevant research teams and programme-specific KE events, to respond to local R&D needs. Automation Fellows, for example, took part in a two day 'Introduction to Robotics' workshop run by the Bristol Robotics Lab (BRL) based at UWE Bristol. Off the success of this workshop, we co-produced a further collaborative workshop. In the burgeoning relationship between our Fellows and BRL researchers, which sat outside discipline or method, we found something that felt like a sliver of the future.

¹⁴. Universities UK and HE Guild n.d. 'KE Concordat: Concordat for the advancement of knowledge exchange in higher education'. www.keconcordat.ac.uk

“Our engineers found the experience of training and working alongside creative and digital practitioners to be very rewarding. These individuals brought a fresh perspective into our workspace – asking questions we had not been asked before and suggesting novel hardware applications that we had not previously considered. It was innovation in action. There is no doubt that this broadened our capacity for considering the ‘art of the possible’.” (Associate Professor Farid Dailami, Manager at BRL)

When Covid-19 struck, this type of programming became impossible. We responded with dedicated online KE coffee mornings for our data prototyping teams, where the KE Managers were able to help teams problem solve in an informal space. On the whole, we felt this was the most successful way to bring KE Managers into the programme delivery, given the restraints of lockdown working. As we refined our creative KE methodology, KE Managers’ scope expanded to designing and facilitating programming for SWCTN members to share research, as well as identifying appropriate routes to investment and funding for members’ ideas and businesses.

DOING KE DIFFERENTLY

We found we were approaching creative KE by focusing on authentic forms of exchange and co-production of ideas, products and services, engaging the expertise of both practice-led and desk-based researchers inside and outside the university. Exchange embodies a sense of both sides benefiting; of mutuality. University collaboration activities, particularly those badged as KT, often imply a one-sided push from universities outward, with R&D primarily happening in the university and being exploited outside of the university. Our creative KE embraces a less linear model. Instead, individuals, businesses, organisations and communities are engaged in research and actively collaborating to develop new methods, tools, products and services in real-world settings.

The values we identified to underpin this KE approach included reciprocity, trust and non-hierarchical methods to ensure diverse voices, perspectives and practices are included throughout processes of innovation. These values are embedded in the Creative KE principles co-produced by the team. These principles are relevant to any group looking to build productive collaborations.

OUR CREATIVE KE PRINCIPLES

- If knowledge is power, KE is sharing power.
- KE is about expanding opportunities for people to participate in creating and storytelling.
- KE generates new value through the exchange of different values.
- KE should challenge inequitable or exclusionary innovation.
- KE is relational and reciprocal, not transactional.
- KE is about fulfilling potential.
- KE is about growing and expanding trust.
- KE allows people to see themselves differently.
- KE is about people, before it is about products.

KE IN LOCAL AND SECTOR-SPECIFIC CONTEXTS

We found that the locality and context of KE is key. We began without a full picture of how to run a cohort-led R&D programme across the partner universities, rather than just as four separate university KE programmes. We had not anticipated that we would need to negotiate bespoke processes and financial models on a per university basis. While university awareness of KE was high, strategies and institutional resources to deliver it outside of research commercialisation activities were uneven. We worked collaboratively and shared best practice as we developed it across our partner organisations.

KE must respond to host universities' expertise, strategy and their connectivity to regional activity and strengths. KE best practice requires understanding what is right for all collaborating parties to make collaborations work; a university, a micro studio and a multinational media company bring different degrees of power and resource to a collaboration. Collaborations, processes which build collaborations, and agreements which encode the collaborations need to be able to recognise this power imbalance and flatten it. With SWCTN's geographical focus, recognising the differences between rural and urban settings was particularly important. Sector opportunities and challenges shift from Bristol to Cornwall. One way we were able to demonstrate how KE can be underpinned by a shared ethos but delivered to respond effectively to varying local needs was by devolving specific microgrant funding streams to each partner organisation.




“The biggest change is that our network is now so much richer. The level of expertise we now have access to, and the connections that have been made for us and our local network, are hugely impactful.”

SWCTN team member

Responsive and context-aware contracting, finance and administration played a central part in building bespoke university processes to deliver on our KE aims, while working within the university administrative context. This was an opportunity to redesign university processes using open and collaborative approaches modelled elsewhere in SWCTN. For example, ensuring that the Fellows own a bigger stake in the IP generated and designing approaches for realising the value of IP outside of a patent and license model, because the vast majority of IP produced by SWCTN members sits in the trademarkable and copyrightable space. These experiences reinforced our understanding that successful KE needs not only clarity of purpose and output but flexibility of method across partners to produce value from collaborations.

Our creative KE facilitation has had indirect impacts on the wider cultural ecology: for example, through the way academic Fellows have taken learnings back into their faculties (discussed further in Section 4 – Research & Evaluation) to how all four partner universities have been catalysed with new R&D programmes and creative spaces.



“The strength of the partnership has demonstrated how it is possible to be respectful and non-competitive when working together.”

SWCTN team member



CASE STUDY FALMOUTH UNIVERSITY

SWCTN played a significant role in new collaborations between Falmouth University and Cornwall-based organisations, aligning with the university's priority in driving the creative industries in the region. As a SWCTN partner, Falmouth strengthened its capacity to win major new funding to benefit the region and develop creative technology spaces.

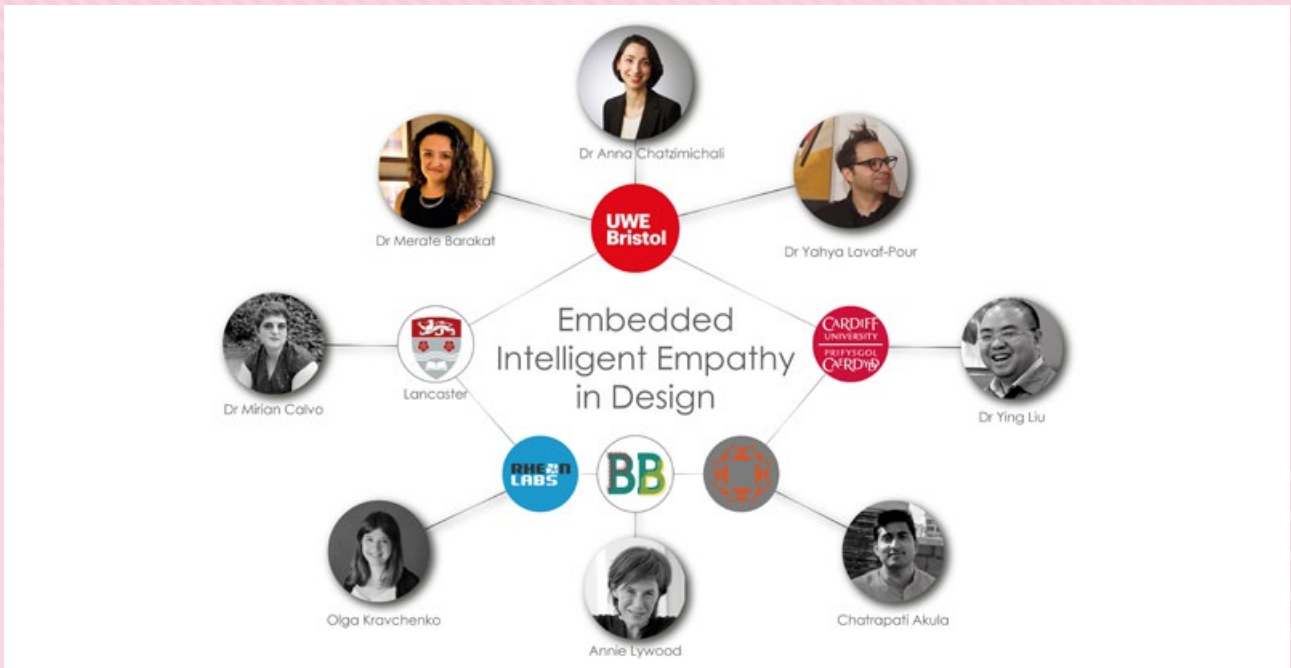
The wAVE immersive project helped expand the use of digital technologies across Cornwall's cultural and heritage sectors¹⁵. In collaboration with Cornwall Museums Partnership, the Local Enterprise Partnership, Falmouth University received £700,000 to develop immersive experiences in five regional museums. Without this funding and the collective expertise of the delivery team, these museums would not have been able to leverage immersive technologies to engage their visitors with their collections in new ways.

Porthmeor Studios in St Ives has been an iconic creative space for artists and students focused around traditional fine art painting and printing since 1938. A partnership between SWCTN, Porthmeor and Falmouth University funded three digital art residencies at the Studios, two of which gained follow-on funding to develop their residency work. The residencies showed the creative potential and uses of new immersive and digital technologies within a fine art context.

SWCTN's Immersion theme highlighted potential development themes for Falmouth University's new partnership with Exeter University on ERDF funding to deliver a £2 million Immersive Business project. More than 70 Cornish businesses – from art-based micros to SMEs – will be supported through a new Immersive Lab at the Penryn campus.

Falmouth's KE team found that smaller devolved funding streams enabled them to be responsive to local R&D challenges in a robust, rapid way. Their Cornwall Covid-19 challenge funded four new proof-of-concept ideas to promote socially distanced ways of staying safe and together. They recognised the university's strong background in bringing new products and services to market; but SWCTN's creative KE approach – focused on inclusive and ethical innovation, IP ownerships, audiences and markets – was key in evidencing the range of businesses, research, and products that could be viable, and how valuable collaborations could be brokered and flourish without the university needing to follow a standard IP approach.

¹⁵ Read more about wAVE: www.cornwallmuseumpartnership.org.uk/wave-project and www.falmouth.ac.uk/news/ps700k-for-future-focused-museums-project



CASE STUDY

MERATE BARAKAT

DATA ACADEMIC FELLOW

Merate (UWE Bristol) joined the Data Fellowship after seeing what it had done for colleagues in previous cohorts. Merate has an interdisciplinary background encompassing architectural engineering, sound and computational design but was struggling to find complementary interests within her department. Meeting the diverse Data cohort completely shifted her approach to research. She was inspired by listening to the way other fellows talked about data, especially following Black Lives Matter protests.

SWCTN allowed her to think about how data is used in architecture and her own practice, better understanding the limitations of quantitative approaches that do not encapsulate issues of power, collective learning and how aspects of sound and perception cannot be put into numbers. This enabled her to solve a research problem she had been grappling with for years. She fed this into her teaching, setting student tasks about the design of slums - rather than European cities, more typical content for architectural courses - and thinking ecologically about the social aspects of design. It also influenced her fellowship research on ambient architecture, which is a new and still technocentric rather than user-led research field.

“My mind has changed and my whole way of researching has changed, which is great. I did not see myself as more than just an architect that is interested in computers, but I’m more comfortable explaining that I have expertise in pervasive media.”

Merate worked with Automation Fellow Anna Chatzimachali on an EPSRC Connected Everything grant, bringing in SWCTN expertise from the Squidsoup team. Merate connected with Data Fellows sound artist Kathy Hinde, architects Natasha Nicholson and Tomas Miller, and academic Matt Baker who influenced her thinking. Kathy, Natasha and Tomas participated in a focus group to develop course content for Merate’s new MSc in Computational Architecture and will be invited to be mentors and guest lecturers.

“SWCTN was a nice place where you could explore and have a creative little bubble to step into and I really would like to replicate that in the MSc that I’m setting up, just for the students, because they do not have that safe space to explore.”

The MSc has commenced with a series of talks and has a strong connection to practitioners in the South West because of SWCTN. Each talk looks at theoretical and philosophical design questions as well as technical aspects.

CREATIVE PRODUCING

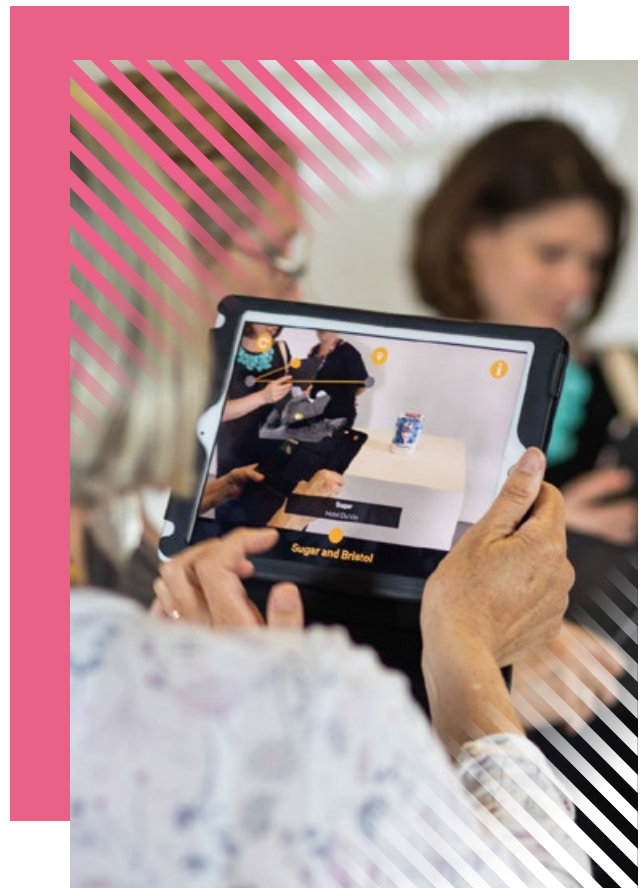
THE ROLE OF THE PRODUCER IN R&D PROGRAMMES

The key role of the producer in this programme was to create the conditions for innovation. Creative production works from the premise that creativity is a mindset that values imagination, playfulness and different ways of looking at things. It is also a practise, a way of testing things through inventive experimentation, and an applied resourcefulness that facilitates the trick of turning nothing into something. Creative Producers are essential components of our diverse cultural ecology – they curate, link, prompt and support personal and project development.

Creative production was delivered by two SWCTN partners, Watershed (Bristol) and Kaleider (Exeter)¹⁶. They used their specialisms in arts and cultural production and drew on past experience running programmes in art and technology development to curate the cohorts.


Our thematic cohorts were led by three creative producers: Hannah Brady, Watershed (Immersion); Charlie Tapp, Kaleider (Automation); and Melissa Blackburn, Watershed (Data).

Alongside our creative producing team, we also commissioned three Producer Fellowships: Kerry Deacon, Anne-Marie Culhane and Christopher Hunt. Their research explored the role of the rural creative producer and hubs, how creative production can respond to environmental crises, and creative production at the intersection of tech and creative industries. The Producer Fellows enhanced our understanding and practice of creative producing in the South West¹⁷.



16. More information at www.watershed.co.uk/about-us and www.kaleider.com/about

17. Details of our Producer Fellows' research findings can be found here: www.swctn.org.uk/creative-producing



“Here are some workshops. They’re compulsory. You need to come along, because actually we’re going to smash you with some ideas and we’re going to work with a whole bunch of different things. We want you to be successful. We’re going to support you in doing this.”

Immersion Fellow

OUR APPROACH TO PRODUCING AND INNOVATION

We learned that success in producing for a creative technology R&D programme was in the way of approaching ideas and bringing them to life. By holding the operations and delivery, the producers brought an attitude to the work that centred relationships, creativity and care, encouraged risk-taking and supported learning and change. What is distinctive about this approach is that the producers were not necessarily experts in creative technology, but in process design and delivery. Through this programme we have learned that at the heart of this method must be a commitment to adapt, to hear the voices of the people in the room and to consciously bring our learning into action.

“With that idea of value and care, in order to ensure that room is diverse and full of the right mix of voices you need, it’s on the producer to create an example,” said Christopher Hunt, Producer Fellow. “The producer brings people to it and uses their position of power to really make those projects and work happen, and to push innovation and to push ideas and to get the people who are working on something together to really think more and think bigger or in different directions.”

COLLECTIVE INNOVATION

Innovation doesn’t happen in a vacuum. Each idea, project and programme takes place in a complex ecology that influences and shapes the work. It is the responsibility of the producer to think about how each environment will help or hinder, and to design processes that give people and ideas the best chance of flourishing.

Designing well for collective innovation means practising the art of convening: gathering the right people together to create meaningful connections and start transforming ideas into action. At the start of a collaborative process there is an opportunity to do this well and set the tone, the atmosphere, and the expectation for everything that follows.

Design choices here are vital: from the purpose of the gathering, the people in the mix, the invitation, the content, to the closing. For the fellowships and prototyping process, we created a workshops series to bring each cohort together with the intention to create a support network, allow ideas to be challenged, and provide inspiration and new ways of thinking about their research.

Before Covid-19 hit, we started each fellowship process somewhere unexpected, beautiful and inspiring. For our first cohort, Immersion, we started our journey – both literal and figurative – on a boat to Mount Edgumbe, a historic park on the Cornish coast. This gave the group a sense of collective adventure and helped shift the focus from people as representatives of institutions, or their daily jobs, to being part of a new community with a shared starting point.

What people find inspiring can be deeply subjective, but we tried to convene inspiring moments into both environment and content in multiple, subtle ways. These became shared reference points, giving fellows the best possible chance of having a transformational experience together. We thought carefully about the external people we brought in to share their expertise.

We resisted the temptation to fill every moment with stimulation and programmed in breathing space. Often what you take away from conferences are chance conversations over coffee. With that in mind, each workshop was intentionally programmed to include lots of opportunity for conversation: long tea breaks, catered lunch, dinner and drinks offered space to find each other without facilitation, to allow for peer-to-peer connections, reflection and learning.

CREATIVE PRODUCING DURING COVID-19

During the Covid-19 pandemic it was much more difficult to replicate this online. We required an entirely different design. We broke the workshops down into smaller chunks, learning that 40 minutes is the maximum we could comfortably spend online without a break. We separated opportunities to be inspired and opportunities to network, so that we could set different conditions for each. One data fellow said:

“For that spark to happen between people who didn’t necessarily have easily identifiable interests, we really needed face-to-face contact. But some real thought had gone into how to make the best of the situation we were in, and trying different ways to build those relationships.”

PRODUCING THE PEOPLE AND IDEAS

The critical and pastoral support the producing team provided to fellows and prototyping teams evolved throughout the programme, as we gained a greater understanding of what was possible with the time and resource available. Creating the conditions for individual innovation meant adapting the way we worked with each person and idea, depending on their individual needs.

For many fellows, the producer was a sounding board, someone to reflect back to them what they were saying and exploring, so that they could better understand what had been learned:

“I thought Hannah [Little] (Data Fellow) has been absolutely brilliant. Every conversation I had with her – something surprising came out of it, and I really felt she had a bit of a similar role to the coach.”

For others, the producer was a champion or cheerleader, and they needed only encouragement that they were on the right track. Often the producing team were connectors, there to listen to all the ideas and spot the overlaps or potential for collaboration. Anne-Marie Culhane, Producer Fellow, said:

“I think the joining things up is fundamental. I think the producer is someone that darts between those different spaces and weaves together the threads. And sometimes it’s beautiful – and sometimes it’s a bit messy and frayed.”

During lockdown, the role of the producer was more personal: the people being supported (as well as our team) were juggling life and work in close proximity. The ability to fully participate became much harder,

and the job of the producer was to see how many barriers could be removed, or how the programme could be adapted to allow for meaningful engagement in this new context. We realised a need to slow down, and to simplify our work. This applied to how we convened people and worked with them individually. As we were responding to a rapidly changing situation, we didn’t always get this right, but we listened and learned a lot.

We learned how to view accessibility differently in online working, which made new and existing barriers to participation more visible: technology, lack of childcare, isolation. Sometimes the solution to these was extra support or resource; sometimes it was acknowledged that deliverables and deadlines needed to change. Inclusion Producer Jazlyn Pinkney said:

“People say ‘let me know if you need any additional requirements’. Some people will have things that they’ve always needed to ask for, like an interpreter or audio description. But that’s a specific example. There’s a world of other stuff if you’re thinking about the subtleties of power dynamics and equity. And you don’t know what you don’t know, and we don’t know what to offer either. You’ve got to have an introductory conversation where you can paint the world of what could be, and ask: ‘How is that going to play out for you? What would bring you closer to what you need?’

“That’s the great thing about a producer: it’s a real person, who can actually do all that kind of work – imagining, and having those conversations with people.”

PRODUCING THE NETWORK

One of the major drivers for Watershed, Kaleider, and the programme as a whole, was to look to the future of the sector. It was the job of the whole SWCTN team to open doors to new people, to spot gaps in who was present, and to plant seeds for the kind of sector we wanted to see grow.

One of the ways we did this was talent development: offering resource and expertise to people outside our funded cohorts and creating new access points to the network. In the short lifespan of the programme, we tested several new methods of talent development.

We piloted a series of talks, workshops and experiences at Kaleider, dedicated to creative energy, innovative thinking and advanced technology. All activity was pay-what-you-decide, meaning participants decided how much the event was worth to them and a greater range of people could participate.

Covid-19 meant the creative industries entered a radical period of change. We pivoted our talent development offer online, providing alternative forms of creative engagement. One example of this was our work on the BBC and Arts Council England programme for emerging artists, New Creatives. SWCTN took an Executive Producer role on the Interactive strand of the programme in 2020/21. One of the funded projects, Before We Disappear, was an interactive film exploring invisibility, hypervisibility and surveillance, from Danish-born Somali artist and poet Asmaa Jama. Following a successful pitch to the BBC, SWCTN provided a handpicked mentor from the Network, and we worked with Asmaa to create the new piece of work which was launched at the Data Showcase and now lives online at the BBC.



CASE STUDY RUBY JENNINGS & JOE WILK

AUTOMATION NEW TALENT FELLOWS AND PROTOTYPING TEAM

The Automation Fellowships resulted in exciting new relationships between artists and technologists, like Ruby and Joe, showing how R&D fellowships could result in new commissions and companies with the right kind of support. For Joe, “working as a digital artist, in the non-physical space, I grabbed hold of people who did physical forms of making” – like Ruby, with her background in large-scale sculpture and set design.

SWCTN started a partnership between the two, who applied for SWCTN prototype funding and began Little Lost Robot, a new CIC. Their prototype combined their interests in playful ways of highlighting and resisting problematic uses of technology in urban settings. Playable Places for Urban Spaces uses soft robotics to create malleable and versatile street furniture that can work with the weather to create hospitable urban enclaves for people and nature.

Ruby and Joe went on to win funding from Arts Council England, Unlimited and the Southbank Centre, Bath & North East Somerset Council Covid-19 business grants, Bath Spa University’s The Studio Recovery Fund and AHRC-funded Bristol+Bath Creative R+D programme. They generated new work and partners like The Egg Theatre in Bath and the Wiltshire Centre for Independent Living.

Their latest projects are Wheel Trails – a geo-located, digital, floor-based street art project, inspired by water trails left by wheelchairs on the ground, to draw intentional marks in digital space – and In the Meanwhile, creatively opening up shop windows in Bath following the dramatic closures in city centres during the Covid-19 pandemic. The pair are booked up with soft robotics workshops, creating a soft robotic postable tool kit and handbook and are touring Playable Spaces across the region. Ruby also gained work with Theatre Bristol. They share space at The Studio, a creative co-working space, and are a growing force in the Bath creative tech community. Ruby said:



Photo credit: Joe Wilk

“SWCTN opened up an entire world of connections and funding for me. I do not come from a background where it is possible to meet with and talk to technologists and academics. Thanks to SWCTN I have managed to completely upskill myself as an artist, to launch a CIC and to keep afloat in a pandemic. I would say honestly that the fellowship has been career changing.”



CASE STUDY

RUPA CHILVERS

DATA FELLOW

Rupa is a Kaleider resident interested in how AI and machine learning fit within the everyday work of health and care sectors. Her fellowship, set against Covid-19 and Black Lives Matter, took her research off in unexpected directions, capitalising on serendipitous connections that she made through SWCTN.

When the Data Fellowship (and pandemic) commenced, Rupa was completing a SWCTN microgrant residency, collaborating with local artist Fraser Anderson to create 3D-printed materialisations of qualitative data related to prison midwifery. A chance tweet put out by a hospital led to Rupa coordinating PPE4Exeter, a network of makers 3D printing and laser cutting visors for health and care workers. Rupa was able to use Fraser's knowledge of 3D printing, Kaleider's studio as a base and Kaleider's support to help coordinate volunteers and connect her to a theatre props designer with knowledge of materials. Through working with creatives, Rupa was exposed to new ways of working:

While Rupa came into SWCTN's Data workshops "with a rational, objective-type viewpoint", from a background in health science, her views and methods shifted as she thought more about racial data in healthcare. SWCTN peer support and feedback gave her confidence and permission to consider data in more subjective and experimental terms and include more creative elements in her work:

"I would say it's definitely changed my career thoughts and options. It's definitely taken me in a direction that I haven't previously had the confidence to do and think about."

Rupa is now working with two artists, under project name Up Close and Personal, to open up a conversation about skin tone and AI, creating a pantone palette painting of skin tone in her family, and using street art to communicate findings from qualitative and personal experiences in healthcare¹⁸. She started a restricted fund within her business, Tangerine Bee, to look at how artists and makers can support healthcare, and hired a creative assistant.

¹⁸ www.myboldspark.com

“There was this rapid maker-based prototyping that was happening. The professional in the creative industry can think about quality at the same time as think about customisation and personalisation.”

INCLUSION

SWCTN operates in a context of structural inequality that discriminates against people along the intersecting lines of race, gender, sexuality, ability, age and class. As SWCTN has developed, the programme has increased its focus on how it can support an inclusive network. The drive to do this has come from both the partners in the programme and from the cohorts of fellows and prototype teams.



SWCTN Immersion Cohort, Photo credit: Jon Aitken

SWCTN operates in a context of structural inequality that discriminates against people along the intersecting lines of race, gender, sexuality, ability, age and class. As SWCTN has developed, the programme has increased its focus on how it can support an inclusive network. The drive to do this has come from both the partners in the programme and from the cohorts of fellows and prototype teams.

Structural inequality in sectors connected to SWCTN was brought into sharp focus by the unfolding crisis caused by Covid-19. The pandemic disproportionately affected those with disabilities, those who are socio-economically disadvantaged and those from Black or ethnic minority backgrounds. In addition, the Black Lives Matter movement focussed all of our minds on what we can do to be an anti-racist network.

Over time, inclusion became an emergent key strategic aim in SWCTN; a process of education and learning for those involved with the programme, and an investigation into what might be possible. The work was iterative, as we tried out various approaches with varying outcomes.

The SWCTN network was built from a rich mix of established and developing researchers, artists, technologists, businesses and practitioners from across the region, representing multiple disciplines and industries.

From the start of the programme, we worked to ensure that our funding calls were promoted within many different networks, and that our reviewing, shortlisting and interview panels were representative. This resulted in increasingly diverse cohorts across the three years, which was crucial to the fellowship mix. However, we also had feedback that the language of our calls and the locations of our outreach events were not inclusive and needed improvement.

Our microgrants allowed university partners to do further specific work around local engagement, ensuring a more diverse pool of people might be able to access our programmes. This meant understanding our previous recruitment data, grassroots organisation research, one-to-one support for new applicants, and also thinking about key issues such as recruitment language and the biases in the

programme. We paired grassroots organisations with creative technologists from SWCTN, with the aim of further diversifying the network.

We explored inclusion within our public showcases, aiming for diversity of representation across our panels, speakers and audience, and commissioning some powerful panels to talk about equality in the creative technology sector. We also emphasised accessibility by incorporating sign language, audio description and captioning across the events.

THE ROLE OF INCLUSION PRODUCER

As Covid-19 tightened its grip and social and racial inequalities were brought into sharp focus during the summer of 2020, we recognised that our team were not fully equipped to support the whole community. This was a key learning for us: the importance of a representative and experienced team in supporting a diverse fellowship.

In response, Watershed recruited an Inclusion Producer, Jazlyn Pinckney, who specialises in thoughtful inclusive programme design and evaluation, and in creating lasting institutional change. She helped the team develop new tools and approaches to inclusion and access, and she looked at our existing recruitment data in order to understand which areas might need work in the future.

Jazlyn brought deep thinking to our prototyping process and helped our prototype businesses become more inclusive. She gave the teams specific tools to think about recruitment processes for their own wider teams; the diversity of their user testing groups and audience development; and how they might, in the future, build an inclusive governance structure in their executive and advisory boards. This work helped our teams to develop their thinking about what inclusion might look like in a new creative technology business: for instance, the Data Cargo prototype based at The Data Place in Plymouth widened their recruitment outreach to ensure that they were bringing diverse new talent into their pool. One data prototype team lead said:



“My involvement with SWCTN has been life changing. The funding and ongoing support has meant I could upskill and innovate in a sector as an underrepresented person. The support has given me the confidence to branch out and take on opportunities and has exponentially increased my network. This is a testament to what can happen when an underrepresented person is adequately supported – they have a greater chance of multiplying that success and bringing others along with them.”

SWCTN Fellow

“Jazlyn gave us great support and her thoughtful questioning helped us to consider how inclusivity can be a built-in part of our user testing and installation work. Having dedicated time to talk about strategy and social responsibility with someone external to the company but well informed about the industry has been vital, and has been offered well through the SWCTN programme.”

Crucially, our Inclusion Producer also developed the way we thought about access in SWCTN – access being the way we ensure that people in our programmes have equal and equitable opportunities to take part in our activities. It became clear that we needed to delineate between access needs previously experienced and the new needs thrown up by Covid-19, which often revolved around tech needs and childcare. Our Inclusion Producer developed a diagnostic process which made supporting these more effective.

EMERGENT INCLUSION

We learned that an iterative and flexible inclusion strategy needs to be embedded in programmes from the very beginning, in a spirit of learning and iteration. Inclusion and accessibility were central to the values of SWCTN. However, the SWCTN team also recognised that there was still a lot of work to do across the Network.

As Covid-19 hit, our newly recruited Data Fellowship was particularly affected by the inequalities highlighted by working online. They wanted us to ensure that all Fellows, particularly those from social minorities, felt seen, supported and empowered rather than isolated or inadequate.

As a result of our learning from that experience, SWCTN commissioned an independent Inclusion Review of the whole SWCTN programme from Dr Addy Adelaine. The aims of this review were to help SWCTN honestly interrogate our work and allow each partner organisation to take that learning forward into any further iteration of SWCTN or other similar projects.

The review¹⁹ found that although those interviewed believed that SWCTN had a commitment to inclusion, inclusive practice worked on an individual basis rather than being fully built into our systems and processes. The review recommended:

- **Staff and facilitator training** to enable appropriate responses to any incidents that arise across the programme – in particular to take the burden of responding to incidents away from marginalised individuals.
- **Inclusive facilitation:** designing events and workshops with an understanding that bringing diverse individuals together needs an awareness of potential power imbalances.
- **Proactive inclusion:** having clear guidance and policies with regard to accessibility and access support, and thinking about providing accessibility (for example video captioning) as standard so that participants need not disclose their identities or needs.
- **An inclusive contingency plan**, co-designed with marginalised individuals, to think about future pandemic or lockdown responses.



“The opportunity to work alongside the production team, their encouragement, support, excitement and commitment to do the ‘work’ around inclusion has massively pushed my practice.”

SWCTN team member

- **Outreach** to ensure that external events are held in community centres and more diverse spaces.
- **Inclusion in academia** to ensure that all partners, particularly university partners, critically examine and challenge their standard way of working.
- **Clear policies** to ensure policies and procedures are cohesive, particularly across the six organisations involved in the SWCTN partnership. Failure to do this makes the experience of marginalised individuals highly variable as it depends primarily on individual relationships and chance encounters.
- **Governance:** creating a truly inclusive and representative board structure and staff team should be a key aim for any future programmes. Making these structures clear and transparent was seen as key in creating a welcoming and open network.

It was clear from our research and from the Inclusion Review that many Network members felt that there were social and financial barriers to building inclusion in the creative technology sector. While SWCTN was often seen as a positive enabler, there was a recognition that there was still a lot of work to do in creating a more representative Network with an inclusive team and in being a positive force for change in the South West.

¹⁹ These are preliminary findings from the SWCTN Inclusion Review by Dr Addy Adelaine, which can be found on the SWCTN website

CREATIVE BUSINESS DEVELOPMENT

Business development was a key part of our methodology at SWCTN. Led by Strategic Designer Gill Wildman, this work was built on learning from the REACT project as well as other creative R&D projects²⁰. Central to that learning was that conventional business development and investment strategies are often ill-suited to microbusinesses, creative businesses and companies committed to quadruple bottom line impacts. As SWCTN engaged with new and established businesses who fell into more than one of these categories, we needed to build a new bespoke creative business development approach.

Learning from REACT informed the work: “Often small and fragile, these microbusinesses are the lifeblood of a regional or city-based creative economy. By understanding their significance and their culture we are able to aggregate small businesses into a cohort and then into a network that offers stability and growth through increased connection opportunities and access to resources²¹.”

The creative tech sector in the South West largely consists of a fluid network of freelancers and microbusinesses, who collaborate with SMEs and larger companies through project-based work. The project-to-project precarity of creative work means that these microbusinesses are unlikely to build up enough capital to grow. They are unlikely to benefit from the traditional growth model associated with tech start-ups where money from friends and family creates a funding bridge to traditional investment.

Our challenge was to develop a new set of tools and ways of working with the creative businesses in our network, which would help them create sustainable and inclusive businesses capable of attracting further investment.



“We started with the idea of creating a data collection and analysis platform, and a group of partners who largely hadn’t worked together. We finished with a working prototype, a robust business plan, a team that worked well together, and a clear path ahead for future development.”

Data prototype team lead

20. Gill runs Bristol-based company Upstarter and has a long-standing relationship with Watershed and the Pervasive Media Studio: www.upstarterincubator.com

21. REACT report, page 13

OUR APPROACH TO CREATIVE BUSINESS DEVELOPMENT

The SWCTN approach in supporting our prototype teams was design-led: informed by Gill's experience in iterative, people-centred design practices that enable creative businesses to bring their skills into the business-making process. The approach was designed to help them define a clear vision for their work, including their values and their business culture; in this way they were more likely to create viable, lasting businesses that also made something that people actually wanted or needed.

This definition and vision was important as many of our prototyping teams were newly-created businesses or new to the creative technology sector. Having worked as creative practitioners or freelancers, some struggled with the rapid growth expectation they associated with business. Some teams were working together creatively for the first time, requiring specific forms of support from the SWCTN team to create strong foundations for their new collaborations.

Over time we developed a coordinated approach to support and develop our prototype businesses, as well as other sole traders and businesses in SWCTN.

PROTOTYPING THE BUSINESS

While teams were busy prototyping their products, it felt essential that we help them to simultaneously prototype their businesses, so that they could launch both at the end of the programme.

Prototyping the Business workshops took a creative, design-led approach to developing new business ideas, testing and refining them over time. The aim was to create adaptable, creative entrepreneurs, iterative business thinking and inclusive audience-focussed companies. Crucially, Prototyping the Business brought a set of methods to help them think about the right form of business for their idea, values and vision.

Prior to the workshops we surveyed our businesses so that we could adjust the content of each workshop based on the cohort's needs. This also gave us the flexibility to add bespoke extra sessions – in IP and alternative financing – where there was a need.



In setting the tone of these workshops, Gill consciously created an atmosphere where sharing, collaboration and trust were central values, replicating the approach used by SWCTN creative producers facilitating Fellows' workshops. The teams were encouraged to work with each other in between workshops to solve problems and share expertise where possible: the opposite of the competitiveness of traditional start-up incubators. This was something they valued highly, especially during Covid-19 lockdowns when businesses were feeling more isolated and vulnerable.

PROTOTYPING THE BUSINESS TOOLKIT

One of our main outputs was the Prototyping the Business Toolkit²², produced within a set of new tools designed to dig into essential aspects of the creative business.

1. Audience – this tool helps identify who you are making this product or service for. We need to truly care about the people we're creating for and put people at the centre of our design.

2. Collaboration – recognising who brings what to a project is crucial at the start, to understand how you will work together. Clear, open and purposeful conversations at this point can save everyone heartache later on.

3. Bundling – this is about considering the different ways your product or service might be offered. How you put these things together for customers and audiences is as creative a process as coming up with the original idea.

4. Business Idea Testing – this helps you to think through the business idea that you are working towards, and to make sure, by testing, that it is the one that appeals to the audience in mind. You may be familiar with testing products and services, and you can take this same approach to testing out the business model itself.

5. Value Proposition – a synthesis of the business idea and how it creates value for people. It's the shortest version of your business' story, the one that captures its essence. Four stages break down this complex process.

6. Your Five Year Plan – helping you think through the goals you have in mind, and how you might get yourself there. Using a five year plan you can look ahead, see the bigger purpose, and put in place important stages that make sense for you.

7. Investor One Pager – the one pager is a simplified version of your business plans and your offer to an investor.

INVESTOR NETWORKS

One thing that had become clear in previous projects was that creative businesses struggle to access funding of suitable size and remit. Traditional equity-based investment is often at too large a scale, demands rapid repayment and involves a loss of control that these companies find unhelpful. We identified a clear gap between seed funding – the kind of very early-stage funding our SWCTN prototype awards provided – and the larger investor-led funds that businesses normally aim for. This gap means many creative businesses start well but flounder as they grow.

Our new tools helped creative companies prepare for investors. We also built investor awareness into our programme. We connected our creative companies to follow-on programmes and investor schemes, and helped our prototype teams understand what each kind of investor might be looking for within an investable proposition.

Through the informal closed space of our annual showcases, teams were able to meet a group of hand picked, sympathetic South West investors who were actively looking to invest in creative technology. These meetings with investors were not pitches. Instead, teams got to hear about what the investors look for in opportunities, and tell investors about their ideas and what they needed. Follow up meetings were arranged for those who wanted to take conversations further.

²² See www.swctn.org.uk/toolkit for more information on when to use each tool, how to use it and what you might get out of it. There are also two worksheets for each area – a blank worksheet and an example completed worksheet, both of which are downloadable. Other existing tools we trust and use in the toolkit include the Business Model Canvas; Theory of Change, the Social Business Model Canvas and the Lean Canvas.



BUSINESS DEVELOPMENT FUND

When a new creative business begins to explore their development needs, they often lack the spare funds to be able pay for that development. SWCTN’s new Business Development Fund²³ responded to this need, supporting 40 businesses across the South West. Creative companies in SWCTN could apply for small²⁴ amounts of funding to explore things like business processes, market research, consultancy and online development. They were then asked to share their reflections on the work to maximise the benefit of the investment for the whole Network.

In addition, we offered one-off, tailored workshops on specific subjects such as business IP for the whole of SWCTN, managing finances, alternative fundraising strategies, user testing under lockdown, and navigating the future. Businesses were encouraged to book one-to-one business development sessions with Gill Wildman and we created Business Reset: a four-week repeatable online resilience programme via the Pervasive Media Studio for creative business. We helped businesses who could not simply move online to think about ways they could pivot their business. We asked: what else can we do with what we have? How else can we reach people? What might they now buy from us?

23. Read recipients’ stories here: tinyurl.com/58ytk4w
24. Up to £3,000

WHAT WE LEARNED

Throughout the three years of SWCTN, we wanted to ensure that the creative companies in our programme learned how to build their businesses on the best foundations.

We learned that creative businesses thrive when their development does not jeopardise their values and purpose. They can and do get ‘better’ at business if they are given the right conditions, networks and support. They need tailored, not generic, business support that works to their skillsets, knowledge sets and mindsets.

During the pandemic, we saw that we needed to respond to changes in what was needed, creating new forms of delivery that kept online contact to a minimum to prevent ‘screen fatigue’, yet maximising the impact of the work done together and helping everyone adapt to new conditions.

We created 22 new businesses through SWCTN, including cooperatives and community interest companies. Some of these businesses will be huge successes and some of them will grow slowly over time, creating new jobs as well as new products and services. Not all of them will scale up, and that is precisely the point: we want a sustainable and thriving creative ecology made up of many businesses organically growing to the size that works for them, and building something new in the South West.



Photo credit: Eight Agency

CASE STUDY JOYANN BOYCE

DATA INDUSTRY FELLOW, PROTOTYPING,
AND BUSINESS DEVELOPMENT FUNDING RECIPIENT

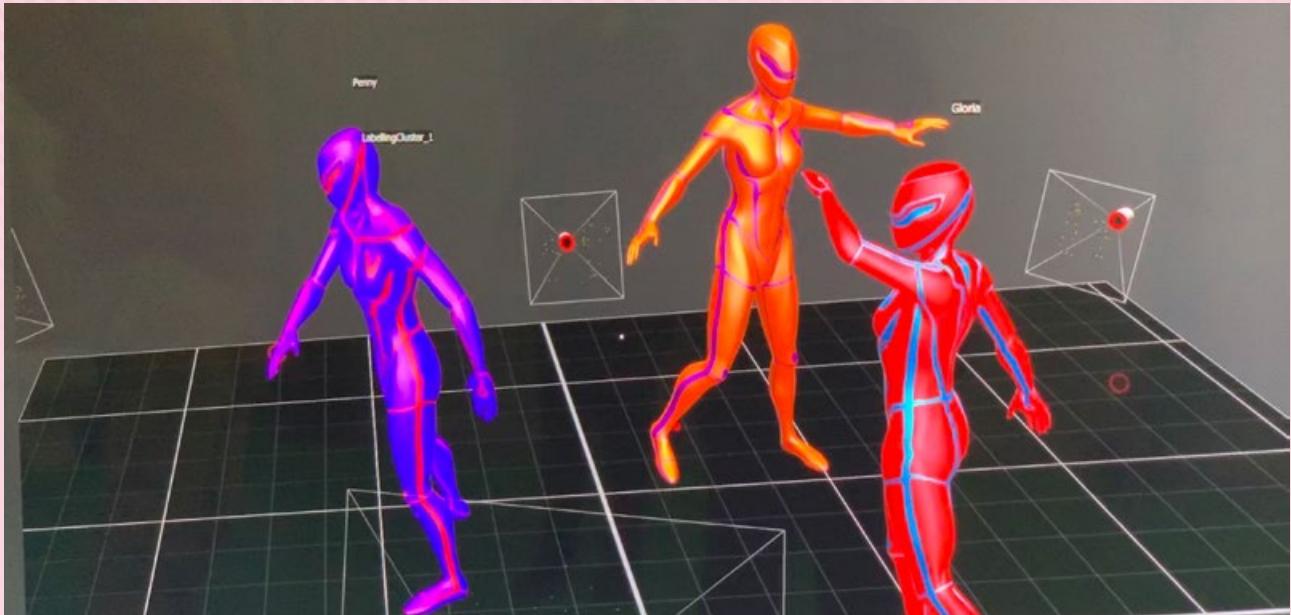
Joyann joined the Data Fellowship, then successfully gained business development and prototyping grants. Joyann's goal was to shift her social media business towards inclusive marketing, using data to create inclusive content production, marketing campaigns and strategies (equality, diversity and inclusion budgets currently focus on recruitment over content). Her fellowship explored what happens when you train a machine with intentionally biased data in favour of those from marginalised backgrounds:

“A lot of the time bias seems not to be considered until the product is deployed. I began to think that we could inject positive bias in the earlier stages of idea development. Marketing people tend to start with a persona, a fictional character, to whom the product is meant to be relevant. Bias can be manipulated as personas are created with a mixture of data from wider society and the marketers' assumptions.”

During the fellowship, Joyann sought to rapidly increase her own knowledge of machine learning. Through SWCTN Joyann was introduced to UWE Bristol's Data Science MSc and found a scholarship grant that would support her to study. Joyann undertook the MSc and continued her business following her prototype development.

Through the prototyping award, Joyann was able to build a team for development, translating the theoretical 'big idea' thinking from her fellowship into something the team understood, with “practical, feasible comparisons and logic behind everything”. She gained mentoring and advice externally and through the SWCTN team, finding them a helpful sounding board, and source of reassurance and tech advice. She also benefitted from sharing learnings with other prototype teams at workshops and KE coffee mornings.

Joyann hired a consultant to do market research on the potential size of the market if the prototype were available and in production. The team conducted user interviews which led to them developing an educational aspect to their prototype. SWCTN has enabled Joyann to more quickly become 'pitch ready' – with a business model, market research to support her business case and a promotional video – and able to apply for next stage investments.



CASE STUDY BEN DUNKS

IMMERSION INDUSTRY FELLOW AND PROTOTYPING

Prior to his Immersion Fellowship, Plymouth-based Ben was investigating the moving body in health and education settings. He was capturing movement through motion capture and accelerometry with colleagues Chris Hunt and Emma McFarland. As a Fellow, Ben explored immersive technologies as a way to measure movement of older women. This was the beginning of a larger exploration into falls prevention and a balance-focused programme.

Ben worked with three women from the Barbican Legends – “a group of incredible older women in Plymouth” – and participants in Renaissance Programme movement classes to build strength and confidence in older women. During his research, Ben had discovered that complex movement is difficult to measure but he could see intuitively that the women improved within a couple of classes, spurring him on to produce the evidence.

Through working with motion capture technology at the University of Bath’s CAMERA studio, Ben collaborated with Dr Polly McGuigan, who has expertise in biomechanics and health, and helped address the complexity problem. As part of his prototyping, Ben and the Barbican Legends travelled together to Bath:

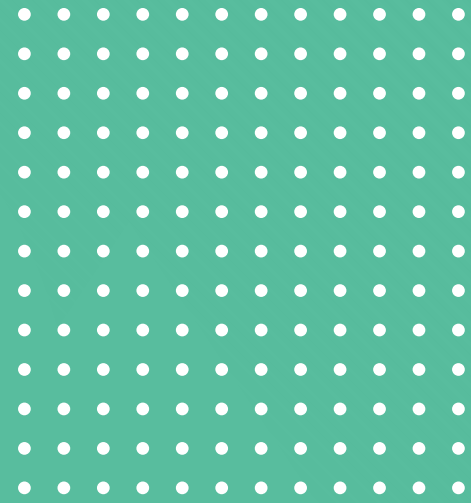
“The capturing process was fun, and it became one of those bizarre situations where every Friday we found ourselves driving to Bath, getting dressed up in black suits with dots, and moved and danced in a strange, green-clad and camera-filled space.”

“I believe no one has used a motion capture studio to properly measure change in improvised movement in a falls prevention programme. I think I was the first. It was immense and incredible and we did ground-breaking things.”

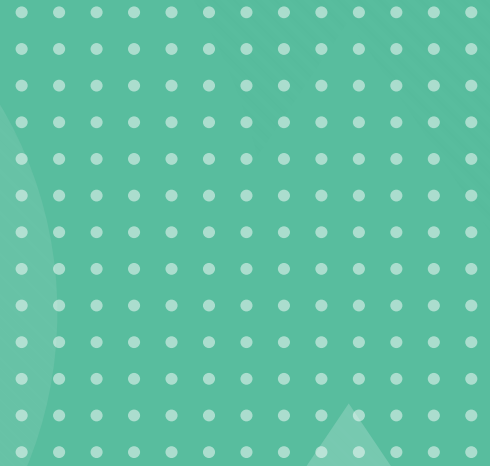
Ben has since launched a dance programme in 1500 schools, prototyped men’s sports pants, run a successful kickstarter and is in talks with a large housing association about online movement programmes for residents. Ben said:

“If SWCTN hadn’t made me feel as though I was doing something valuable, I wouldn’t have sent the email to make [the dance programme] happen. Without exaggeration SWCTN has fundamentally changed my life, my work and my future.”

RESEARCH & EVALUATION



“The ability to go to conferences and talk about automation has opened up industry-specific contacts. It’s more than just the resource to be there: it is also the opportunity and the headspace to get the point of view and industry knowledge to where it needs to be, in order to talk to the people that need to do it.”



RESEARCH & EVALUATION IN SWCTN

Alongside the delivery of the programme, we conducted research to measure and evaluate our success to continuously improve the programme content and funding streams we offered SWCTN members²⁵. Our research explored the people, places, practices and values that hold regional innovation networks together, as well as challenges related to network development including geography and differences in cultural capital and skills. We tested the theory of cultural ecologies to validate our methods for connecting people through creative knowledge exchange.

SURVEYING OUR NETWORK

We surveyed our Network members annually to find out which resources they were using in the programme, who they had connected to meaningfully, and what types of outcomes resulted from their time with SWCTN (new work, new commissions, new publications, etc.).

INTERVIEWING SWCTN RECIPIENTS

We used in-depth semi-structured interviews to find out who, how and why people were connecting, to better understand how SWCTN was supporting different mechanisms for KE and what outcomes the KE resulted in. To refine the process of delivering creative KE through SWCTN, we asked what worked well and what could be done differently.

NETWORK MAPPING

We used survey and interview data to map people, places and outputs, testing how and where industry-university and inter-sectoral collaborations were resulting from the programme. We used open-source software packages Gephi and DMX to visualise SWCTN's emerging relationships²⁶. Gephi was suited to visualising and analysing our wider network, while DMX captured richer detail, adding further meaning to connections.

TEAM EVALUATION

We conducted an open-ended survey with our team at project close to bring together what we'd learned throughout the project. It asked about our strengths and weaknesses, our capacity building, and the regional, organisational and professional impacts working on the programme has had. This supplemented iterative evaluation throughout SWCTN programming that took place in regular delivery team meetings.

25. The research team: Liz Roberts, Nicole Foster and Josh Sandin, supported by Jon Dovey

26. Gephi is a leading open-source visualisation and exploration software for network and graphs: www.gephi.org. DMX is a semantic data platform map, allowing the user to explore and share networked information with meaningful relationships: www.dmx.berlin

HYBRID SPACES COMMISSIONED RESEARCH

We commissioned two pieces of additional research around hybrid spaces of working, following the Covid-19 pandemic and our shift to online programming. The first was led by Bath Spa University. They commissioned Automation Fellow Mollie Claypool and her team to examine the possibilities of hybrid working and collaboration methods (as piloted within SWCTN during Covid-19 lockdowns) for delivering regional and international R&D and KE programmes.

The second piece of research was led by Falmouth University and focused on reshaping spaces for health and care. It focused on hybrid working models as activators for the health and care sector within Cornwall. An internal report and a position paper called Hyperlocal Health were produced. SWCTN Data Fellow Annie Legge was commissioned as DOT PROJECT to develop a visual data map of the health and care sector in Devon and Cornwall.

OUR FINDINGS: CREATING THE CONDITIONS FOR INNOVATION

SWCTN Fellows said that one of the most significant benefits of participating in SWCTN were precisely the conditions that we purposefully created through the programme's design. These conditions resulted in multiple planned and unexpected positive impacts on the Fellows, personally and professionally. Innovation and impact are not simple linear processes with fixed inputs and outputs; the conditions created by the programme design increased the possibility of connection and allowed them to flourish.

The conditions created for creativity and innovation by SWCTN – diversity of people and ideas, safety to take risks, support and mentoring, time for deep thinking, access to new networks – and the interdisciplinary, cross-sector connections built, have meant that Fellows have been able to change their ways of thinking, practicing and working (see Table A). The 'big ideas' and mix of voices in the room contributed to creative thinking through learning about how others tackled problems differently. One Automation Fellow said:

"A slightly different point of view or a different demographic actually adds a hell of a lot in terms of your headspace and way of thinking. As do different people's thoughts on how to approach problems, which, within our niche realm, can be fairly closed off."

Fellows most valued the time for deep thinking that SWCTN enabled, something rare within the creative and academic sectors. The curation of the cohorts gave Fellows the feeling that they were in a collegial, safe and accessible space, but that they were also being pushed out of their comfort zone.

Another Automation Fellow said: "It was fun, it was safe, it was engaging, it was challenging, but it dipped in and out of the comfort zone on a regular basis, which is what you need."

Through interviews and other feedback mechanisms within the delivery team we could iterate after each cohort and build on parts of the programme delivered to respond to concerns about workshop content and dynamics. Specifically, the balance between guest lectures, time for Fellows to present their work and opportunities for connecting and collaborating across the cohort were important to Fellows.



Photo credit: Jon Aitken

One of the challenges around creating KE through an emerging Network was the differing expectations between sectors and work practices around what was fair to ask of someone: to what extent did Fellows feel happy to share expertise for free and how do you ethically transition an organic conversation into a discussion about payment?

“We wouldn’t work on a monetary exchange basis, we’d just give our time to work together, through the idea exchange,” one Data Fellow said. “I just love collaborating, but I know it’s a different thing to ask my friends who I make [in SWCTN] for their skills. So there’s always been this sort of ambiguity.”

Our commissioned Inclusion Review also found that differences between how members valued their time when writing bids and when collaborating with each other was an issue. Fellows said that more guidance from SWCTN around acceptable costings for a day rate and a clearer steer on other acceptable costs for funded opportunities would be helpful.

The result of SWCTN as a network-building programme is that Fellows have accessed new networks, using SWCTN itself as the primary network, as an opener of doors to other networks and an enabler for building local and regional connections in the South West. They have grown confidence around their own expertise, honing their proposition with a large number in the cohorts pivoting towards career and life changes. One Automation Fellow said:

“The ability to go to conferences and talk about automation has opened up industry-specific contacts. It’s more than just the resource to be there: it is also the opportunity and the headspace to get the point of view and industry knowledge to where it needs to be, in order to talk to the people that need to do it.”

WHAT IS THE ADDED VALUE?

Our fellows and prototype teams went on to win funding to continue R&D begun during their SWCTN participation. 13 gained grants with arts and cultural organisations such as Arts Council England, while 20 gained grants from research councils and university internal funding. 8 of our Academic Fellows won further funding for their universities as well as in-kind support such as mentoring, space and equipment.

For some of the fellows, the process shifted their whole approach to R&D. Some rethought their own practise, both broadening their perspectives and changing the types of collaborations they seek. Fellows were able to accrue large amounts of new knowledge quickly from the cohort and learn new skills or trial different research methods.

Often, fellows’ research direction shifted around a particular ‘lightbulb’ moment when ideas crystallised, often during KE with other Fellows. For Academic Fellows, this moment often related to how they could demonstrate the importance of their research to a wider audience. One Automation Fellow was speaking to a member of the Network when a single question prompted a huge realisation:

“She asked me a meaningful question: why do we need to predict a pedestrian’s trajectory? First of all, I need to understand: why is my research useful? And then I go back to review the papers and, during traffic, five seconds can save people’s lives. I didn’t realise it; I just did it.”

CREATIVE KE WITHIN THE FELLOWSHIPS

Academics have used their experience within SWCTN to radically change their research, teaching and interactions with university colleagues, contributing to a growing creative technology talent pipeline for the future in the South West (see Table B). SWCTN team academic Teresa Dillon and Academic Data Fellow Merate Barakat are growing a Resonant Ecologies Research Group at UWE Bristol, stemming from their shared interests within sound and urban spaces. Also at UWE Bristol, Data Fellow Hannah Little is working with Teresa to develop a data rights research group.

Academic Fellows have invited their industry peers within SWCTN as guest lecturers on their courses, demonstrating new opportunities to students and examples of what working in an inclusive creative technology sector looks like. This has given Industry Fellows an opportunity to gain new employment, diversify their income streams and work in a new environment. SWCTN's focus on the ethics and inclusion of technology and the creative sector allowed for different types of thinking to enter into academics' own research practices and the graduate syllabus, challenging students' beliefs and values.

One Immersion Fellow said: "I have been able to use a lot of the fellowship to bring in some really good expertise into the course, which has been really, really exciting for the students."

Another Data Fellow said: "Some of what I've been looking at in relation to my project is ethics-based identity politics. I'll definitely reorganise the way I'm delivering one of my modules to be braver, and to be more discursive, following my experiences of this."


Academics at Bath Spa University would not have gained knowledge and support from the Watershed and Kaleider without SWCTN, which has enabled them to build a creative hub within their university - the first of its kind in Bath.

CREATIVE KE ACROSS DIFFERENT SECTORS

Through SWCTN we saw long-term, meaningful relationships built between creative industries and other sectors, leading to diverse outputs and business development. For individuals and businesses from sectors like health, manufacturing, agriculture, the green economy and architecture, we have seen how participating in a creative network with creative industries and exploring opportunities for creative technology has resulted in a wide range of value. Coming into contact with artistic or design-led practices more familiar in the creative sector and disciplines, allowed Fellows to open up their research, becoming more exploratory and introducing subjective and user-centred aspects (see Table B).

Our work shows that creativity isn't the sole purview of arts or the creative industries, but recognition of it as an animating and driving force often does not get much traction beyond the walls of the creative industries. In SWCTN, it has gone beyond what Markusen and Scrock describe as the 'artistic dividend' - the added value creative industries generate for other industries²⁷. Instead, our cohorts resulted in reciprocal exchange between sectors that sparked critical thinking, innovative practices and outcomes.

Through having the time and space to experiment with different modes of working and thinking, and collaborate with different types of people, Fellows gained confidence about their professional identities and practises, in reaching out to or shifting their professional community, and moving into or working across different sectors.



"It certainly has done a lot for my own self-belief in this work, so it was a validation - a springboard"

Data Fellow

27. Markusen, Ann, and Greg Schrock. 2006. 'The Artistic Dividend: Urban Artistic Specialisation and Economic Development Implications'. *Urban Studies* 43 (10): 1661-86.



TABLE A

<p>CREATING CONDITIONS FOR CONNECTIVITY AND INNOVATION The most significant benefits of participating in SWCTN for the fellows included:</p>	<p>WHAT WAS THE ADDED VALUE OF SWCTN FELLOWSHIPS? SWCTN support and networks have enabled fellows to change their ways of thinking, practicing and working:</p>
<p>The mix of voices and backgrounds created a positive dynamic.</p>	<p>Grown confidence around their own expertise and honing their proposition.</p>
<p>Being exposed to different people, sectors and approaches than they would ordinarily have access to.</p>	<p>Gaining a new skill set or knowledge base. SWCTN enabled quick access to new knowledge.</p>
<p>Feeling inspired being in a room with 'big ideas'.</p>	<p>Ability to trial and experiment with new research methods, technologies or processes.</p>
<p>Creative thinking through learning about how others tackled problems differently.</p>	<p>Career and life pivots.</p>
<p>Challenging disciplinary perspectives and reconfiguring own assumptions in more interdisciplinary way.</p>	<p>Opening up their research or artistic practices, becoming more exploratory or introducing more personal forms of knowledge and data.</p>
<p>Deep-thinking time without the 'box ticking' associated with some other grants.</p>	<p>Many Fellows gained experience of human-centred, participatory and user-focused research or R&D.</p>
<p>Having a business case (i.e. being funded) for reflection and strategic planning.</p>	<p>Industry Fellows gained solid grounding of research methods, giving them a new way to frame their arts practice, for example, and inspiring five Fellows (to date) to further study at master's and PhD level.</p>
<p>Being part of a collegial, safe and accessible space.</p>	<p>Gaining confidence in existing or new professional identities and practices and reaching out to professional communities.</p>
<p>Being challenged to dip in and out of their comfort zones, and the safety to take risks.</p>	<p>Gaining skills in interdisciplinary working, enabling them to make more radical collaborations in the future.</p>
<p>Support and sense of belonging for those geographically isolated or stepping away from company roles to 'go it alone'.</p>	<p>Support and sense of belonging for those geographically isolated or stepping away from company roles to 'go it alone'.</p>
<p>Accessing new networks. SWCTN opened doors and enabled people to build connections in the South West.</p>	<p>Accessing new networks. SWCTN opened doors and enabled people to build connections in the South West.</p>

TABLE B

UNIVERSITY-LEVEL IMPACTS OF CREATIVE KE SWCTN university-creative industries KE has had a multitude of university-level impacts:	CREATIVE SPILLOVER FOR CROSS-SECTORAL WORKING For other sectors, working alongside creative industries in SWCTN has resulted in a wide range of value:
Academics inviting new industry contacts to guest lecture, e.g. New Talent Fellows.	Coming into contact with critical voices.
Consultation with new industry contacts on course development.	Thinking more about the social and ethical aspects of technology.
Inspired by fellowship content, academics developing more practise-based, multi-disciplinary or up-to-date courses.	Being encouraged to play and experiment.
Creation of a creative-focused PhD linked to fellowship, based in a more traditional university department.	Questioning and opening up thinking rather than narrowing focus.
Expanding academics' interdisciplinary expertise, enabling them to enter existing university research groups previously outside their purview.	Asking deeper questions and diving down rabbit holes.
Creation of university-wide and cross-university thematic research groups that link STEM and creative departments.	Finding people with creative and technical skills.
Enabling new cross-disciplinary and university-creative industry collaborative research bids.	Gaining confidence with more radical collaborations.
Changing how academics think about and conduct research, and as a result, how they teach it.	Expanding own professional remit and business offer.
Paying students as research assistants, creating new job opportunities.	Working at speed with agility.
	Feeling more comfortable with subjective or personal forms of research and data.
	Putting the human at the centre of design.

CONNECTING OUR COHORTS

On average, SWCTN members told us they had made 12 new useful connections from their contact with the Network. This number rose to 19 for those who had been funded or participated in our workshop programmes²⁸.

Cultivating and connecting diverse networks of people and resources were core aims of the SWCTN approach. Human relationships are complex, so we used social network tools to help draw insight from the web of connections that emerged in SWCTN and evaluate whether our aims were successful. Individual SWCTN members were represented as dots - nodes - with their new relationships and interactions represented in the lines - edges - that connect them. This mapping identified patterns of relation, uncovering the most significant connections in SWCTN's emerging social spheres.

We focused this analysis on connections made by the SWCTN members we surveyed, asking them to list their most significant new connections. The greater the number of meaningful relationships made, the larger their dot appears in the network visualisation. It is important to remember that this is not a complete representation of the Network; the mapping only reflects the connections of those who participated in surveys and interviews throughout SWCTN's evolution.

We first mapped how the cohorts were interacting. Fig. 1: Cohort shows the Immersion cohort in blue, the Automation cohort in green and the Data cohort in orange. As expected, most new connections happened within the cohorts where the SWCTN team facilitated engagement and collaboration. We can also see a range of connections between the cohorts. We labelled those in the Network who were not part of funded cohorts as non-recipients. These appear at the edges of the visualisation and illustrate how core Network activity linked to wider SWCTN membership: for example, through our public events and the facilitation of the creative producing and KE teams.

FIG. 1



- 30.3% Non-recipient
- 17.9% Automation
- 17.2% Immersion
- 14.8% Data
- 13% SWCTN Team
- 6.8% Other Recipient

The map shows how the Immersion cohort heavily interacted with more of the SWCTN team, which may be because they needed greatest support as the first cohort. The Data cohorts had fewer connections amongst themselves while also having the highest proportion of connections developed outside of their cohort. However, this could be skewed by the smaller number of responses from the Data cohort and may result from their SWCTN programme happening online due to the Covid-19 pandemic, with fewer opportunities to meet in person and less time for relationships to develop as the last cohort to join.

²⁸. In our 2020 survey, 62 respondents noted a total of 715 new connections, averaging 12

FIG. 2



- 27.7% University - Academic
- 13% Artist
- 11.1% Creative Director
- 11.1% Creative Technologist
- 9.9% Other Profession
- 9.3% University - Student/Other
- 8.6% Creative Producer
- 3.7% IT Professional
- 3.1% Design, Engineering or Manufacture
- 2.5% Funder/Investor

We then mapped new connections according to self-reported job titles, which we grouped into a manageable number of categories (Fig. 2 - Job Category). Many of our SWCTN cohorts identified themselves professionally as some form of director of a creative company, creative technologist or artist. This formed the primary mix of industry roles in SWCTN, alongside academics and other tech professionals. While regional R&D is often premised on clustering around particular sectors or roles, SWCTN does not show any such clustering. This is probably because of the interdisciplinary nature of

creative technology, our programme design around cross-disciplinary themes and the scale at which creative industries work, bringing together groups of freelancers to fulfil a specific role within a project. Fellows' willingness to engage with and learn from others with different experiences and expertise formed the basis for the active knowledge exchange throughout the programme. When we aggregated to meta-industry levels, the multi-directional nature of knowledge exchange within SWCTN's cultural ecology becomes really clear, with evident cross-fertilisation between universities (labelled as Education), Creative Industries and Other Sectors (Fig. 3 - Meta Industry).

FIG. 3

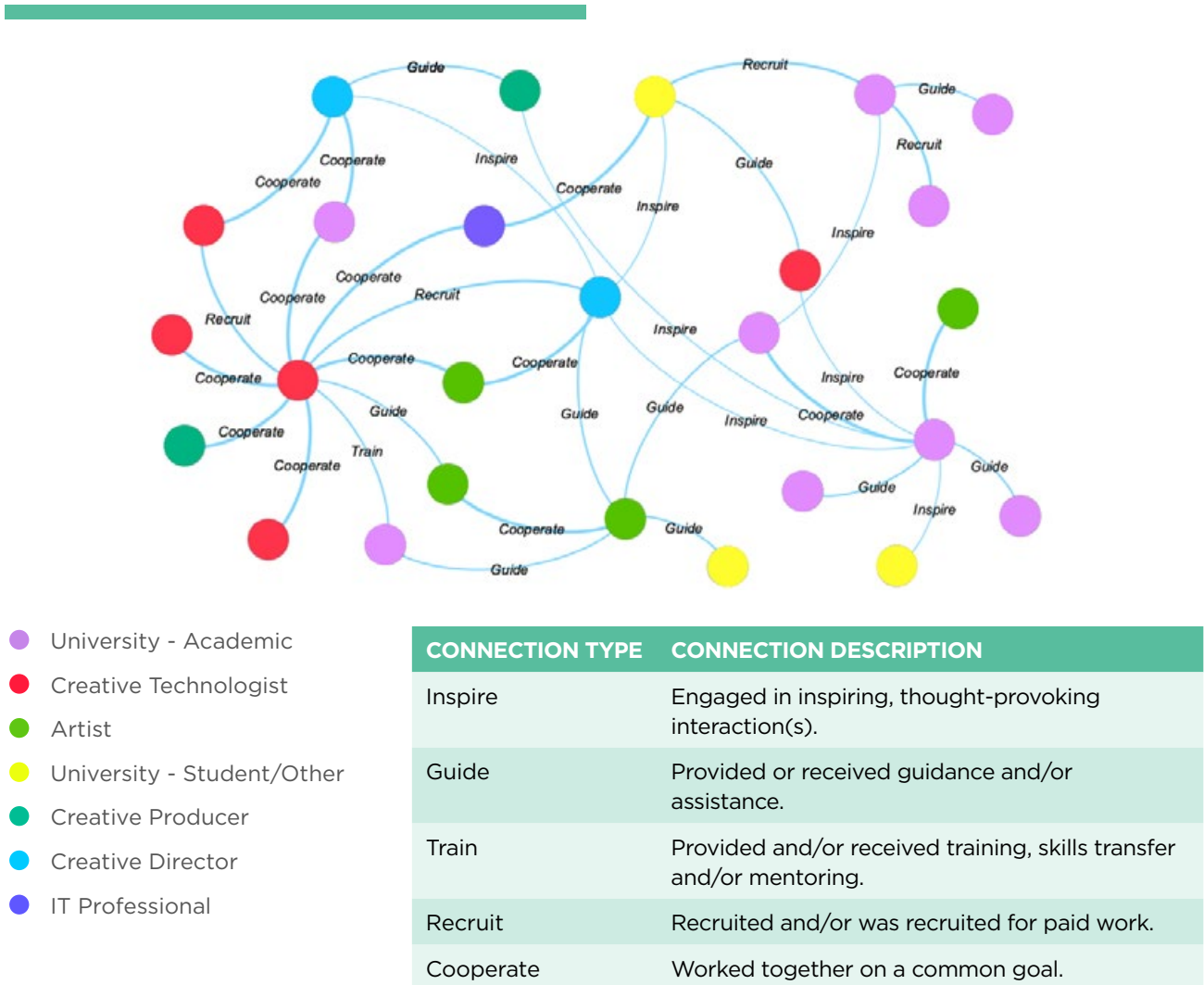


- 46.3% Creative Industries
- 37% Education
- 16.7% Other Industry

Some of the strongest connections arose within the Automation cohort, shown by a high concentration of larger nodes. We decided to examine this clustering to see what types of connections they described as significant. Fig. 4 - Focused Network shows a group of our Automation Fellows who had different types of exchange. We created five categories of exchange based on inductive coding - our emergent understanding and refinement of the connections - from the interviews we conducted. Fellows were then asked to self-select the category for each of their connections. We weighted the connection types based on an inspiring conversation being the lightest form of exchange (even though it could be incredibly significant) to the most significant form of exchange being cooperation, described as collaborating on a common goal such as a new project (Table C). The thickness of the connecting lines corresponds with this weighting.

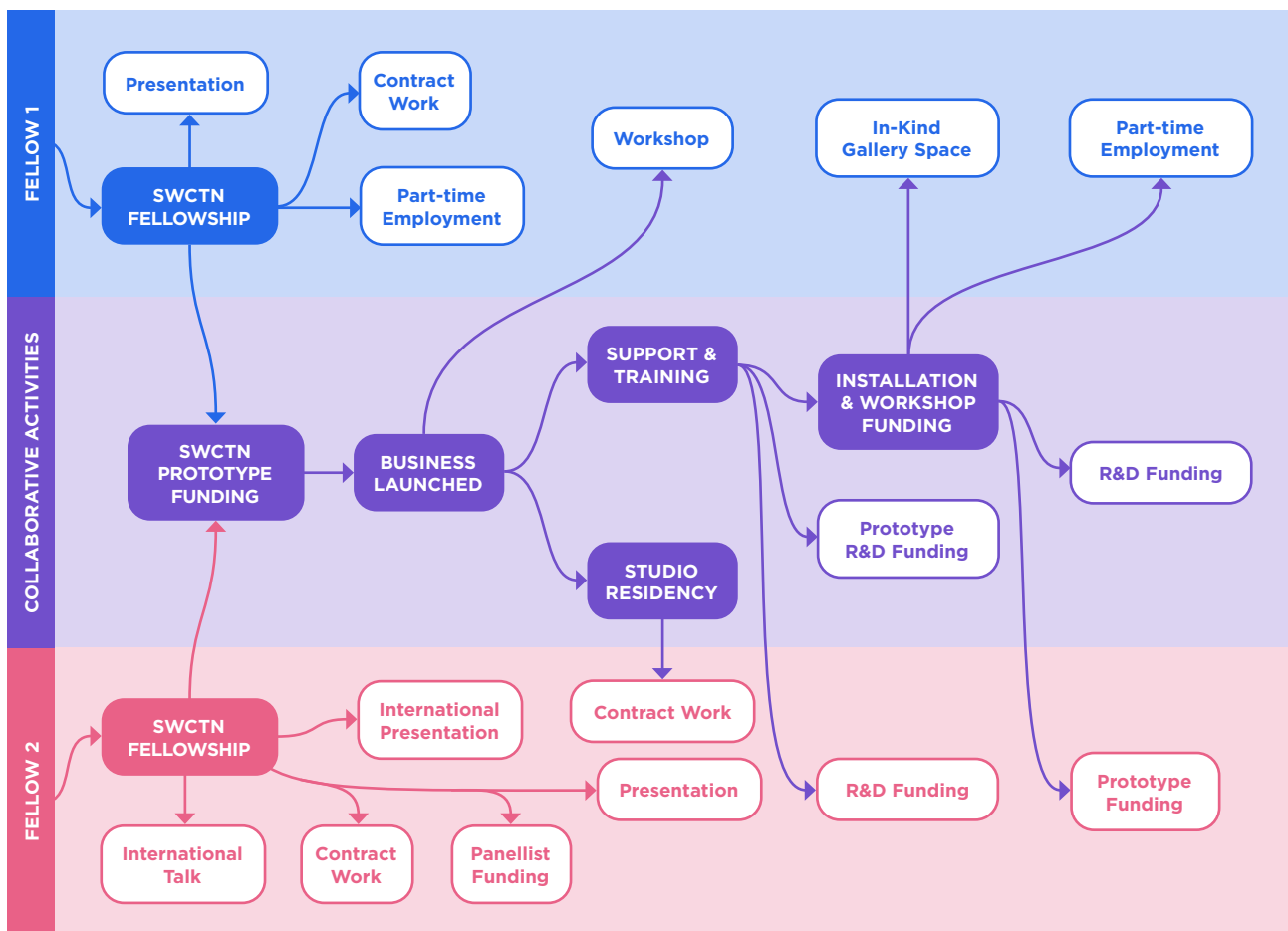
Fig 4 - Focused Network evidences the diversity in relations created through facilitation and serendipity as a result of SWCTN across different job roles and sectors, with a high degree of 'cooperate' labels showing new collaborations resulting from SWCTN. These collaborations resulted in numerous outputs. However, clearly mapping the breadth of outputs proved challenging as they ranged from new businesses and job contracts to new grants, to delivering presentations and workshops at academic, industry and public events. Without reducing the number of nodes, it would be too messy to decipher. We decided to focus on a particularly strong connection and show the outputs that this resulted in. By looking at the survey responses we had about what types of activities or outputs that had resulted from SWCTN members' participation, we were again able to create a manageable set of labels to describe them.

FIG 4



We selected two Fellows who were unlikely to have met without participating in SWCTN because they had different professional networks within and beyond their city. They ended up creating a new business and receiving multiple grants as a result of joining forces on a SWCTN prototype grant. Fig. 5 - Map of Selected Outputs illustrates how the SWCTN Fellowship led to a distinct R&D journey, bringing together different skill sets within a common ethos.

FIG 5 - MAP OF SELECTED OUTPUTS



We can see the cultural ecology of the South West strongly at play within Fig. 5. The creation of a new business, as a result of gaining SWCTN prototype funding, required them to acquire new studio space where they could work together. They were able to embed themselves in the professional, creative and academic communities linked to those spaces,

which gave them access to new forms of work, funding, support and training. This collaboration also speaks to the freelance nature of much of the work. We can see how the Fellows operate in a microecology of joint and independent work contracts and grants to carry out project-based work.

THE FUTURE

CREATIVE TECHNOLOGY FUTURES IN THE SOUTH WEST

The biggest challenges of the next decade centre on the climate crisis and sustainable economic development. With industry expertise in emerging creative technologies, climate science, advanced manufacturing and agriculture, the South West is poised to lead in this field.

As with the development of any large programme, the SWCTN team experienced challenges, from learning how to work across a large geographical region, translating our inclusive aims into better inclusive practice, to responding to Covid-19. As a result, SWCTN became a collaborative and resilient network, ready to tackle new challenges and envision more inclusive and sustainable post-carbon futures through its distinctive, interdisciplinary approaches to creative technology innovation. Creative qualities of adaptability and resilience will be key to building sustainable futures. The regional capacity we built through SWCTN puts the South West in a strong position to do this, specifically in the development of green economies – a notable emergent theme from fellows and prototype teams.

SWCTN, set against a global pandemic and economic downturn, has highlighted the urgent need and desire for new languages of value and success to support creative and cultural business development, cross-discipline and cross-sector relationships, and alternatives to business-as-usual growth narratives. SWCTN's researchers, New Talent Fellows and start-ups are the seedbed for the future capacity to begin prototyping inclusive and sustainable economies. Our methodologies of KE, creative producing and business development, supported by research and creative technology expertise, enabled network participants to take risks, learn new skills, disrupt assumptions, and increase the confidence and capabilities needed to forge new collaborations, create high-impact work, and develop value-led business models to sustain R&D.

We plan to continue our unique partnership to support our regional network to grow further. The collaboration and joint learning of partner organisations in SWCTN means that each of us is taking forward a strong model of creative KE and creative technology R&D, as well as best practice around university-industry and cross-sector relationship building, inclusion and accessibility.

We have strengthened capacity to continue to build expertise in the South West through our collaborative and separate projects, underpinned by the following research questions:

- What is the role of creative technology in helping to build an inclusive, post-carbon economy?
- What kinds of creative business models, funding mechanisms, innovation spaces, development support, production and distribution methods will be needed?
- What are appropriate and meaningful measures to evidence progress towards a more healthy, sustainable and inclusive creative technology sector beyond economic productivity?

WHERE WE HAVE PRESENTED SWCTN WORK

2019 Ars Electronica Festival,
POSTCITY Linz, Austria

Anthropology + Technology Conference, Bristol

B in Bath

Bath Digital Festival

Bath Spa University

Beyond Conference, Edinburgh

Beyond Festival, Germany

BFI Future Film Festival

Canary Wharf, London

Cannes Festival

CAST, Cornwall

Cntrl Shift Festival, Bristol

Creative England, London

Creative XR Showcase, UK

Digital Catapult, UK

Digital Cultures Festival, Warsaw

DRAGoN Seminar series, Bristol

Dyson Ltd

Echoes'21 conference, India

Eden Project, Cornwall

European Conference of Computer Vision

FOCUS - The Meeting Place for International
Production, London, 2019

Futur Ville summit, Bristol, 2019

Hello Culture, Manchester + Bristol

ICPF 2020: International Conference on Functional
Programming (online)

International Documentary Festival Amsterdam

Kaleider Mikrofest, Exeter

Knowle West Media Centre, Bristol

MIT OpenDocLab, Massachusetts

Mix Conference, Bath

Mozilla Festival, 2019

Mutek, Montreal

Negotiable Matters Conference, Beijing

Outland Festival The Joyous Thing 2

Pavilion Dance South West

Pervasive Media Studio, Bristol

RadicalxChange

Scottsdale Museum of Contemporary Art, Arizona US

Simple Things Festival, Bristol

Somerset House Studios, 2020

TechSPARK, Bristol

Technology in Music Performance Symposium,
Birmingham Conservatoire

TEDxBristol

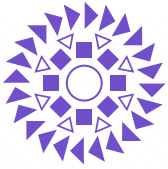
The International Conference on New Interfaces
for Musical Expression, Birmingham

VRTL Academy, Belgium

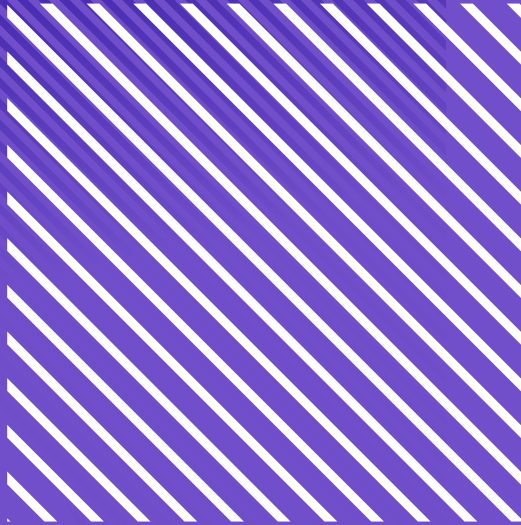
Wow Museum, Zurich

WRITING TEAM:

Liz Roberts, Tom Trehella, Melissa Blackburn,
Josh Sandin, Charlie Tapp, Nicole Foster,
Gill Wildman and Jon Dovey.



**SOUTH WEST
CREATIVE
TECHNOLOGY
NETWORK**



**UK Research
and Innovation**

Funded through Research England's
Connecting Capability Fund