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Over the last four years, the Knowledge Exchange Hubs for the Creative Economy have worked across disciplines and sectors to embed arts and humanities research in the wider business community across the UK.

The establishment of these four Hubs, each with a very different approach to a common agenda, was a ground-breaking initiative, which has paid off triumphantly. Their focus has been on partnership – with small businesses, with public sector organisations, with national arts and heritage bodies and with entrepreneurs. Their success shows that individual researchers can not only engage productively with these sectors but that universities themselves are perfectly positioned to be key drivers of the local creative economy.

The reach has been astonishing. 350 businesses, 320 academics and 171 third sector organisations have been involved in new forms of collaboration. Their diversity reflects the imaginative approach of the Hubs to business partnerships. Design in Action, for instance, based in Dundee, focused on the input of design research and on co-creation of entrepreneurial business models, with a particular focus on the rural economy. Bristol-based REACT’s emphasis on cultural heritage and education drew on cutting edge research in humanities subjects as well as the arts to develop new products and services in industries from publishing to digital gaming. Creative Exchange, hosted by the University of Lancaster, made a major input into enhancing ‘the public space’, working with local authorities and public bodies in the North West. Creativeworks London had significant impact in performing, design and media sectors, placing researchers in residencies and offering short-term vouchers for companies to benefit from research placements to boost London’s creative dynamism.

The Hubs have also made a real contribution to the developing National Skills Agenda, highlighted most obviously in the Creative Exchange’s innovative raft of PhDs, training a new generation of intellectually versatile researchers by requiring them to engage with non-academic organisations from the start of the doctoral programme. This is also seen in the advanced development of creative people, whether university researchers or professionals in businesses, civic bodies and media or heritage organisations, who have all been involved in a process of mutual learning.

Undoubtedly there have been challenges, not least in finding a workable model for intellectual property, and in navigating institutional bureaucracy unused to dealing with the kinds of companies arts and humanities researchers find compatible. And, as Hub Directors point out, four years is not a long time for emergent businesses, many of which did not come to the programme until half way through the funding period, to prove their worth.

If I had to single out one major achievement from the many, it would be the culture change in those universities, which have engaged in Hub activity, and the potential that has been released to stimulate enterprise beyond the academy. Creative people produce creative business. Collectively the work of the Hubs has contributed to a shift in thinking about the contexts in which arts and humanities researchers operate and ways in which they can contribute to growth in a sector that currently generates £84 billion to the national purse. Their most enduring legacy will be for those institutions that are prepared to embed a policy for the cultural industries at a strategic level.

It has been a privilege to chair the Oversight and Development Group over this exciting period. We now look forward to seeing how the momentum generated by the Hubs can be sustained for the future.

Professor Judy Simons, Chair
Oversight and Development Group
The UK Creative Economy is large, variegated and dispersed. It is founded upon a diverse base of organisations; from the UK’s leading cultural institutions and tourist attractions, through to its local and regional arts and cultural organisations, through to profuse constellations of creative and digital micro businesses that run the length and breadth of the UK.

The UK research base plays a formative role in generating the knowledge, skills and ideas upon which this creative economy depends. Connections between researchers and the creative and cultural industries are vital to unlocking their future growth, and also to ensuring that creativity spills over into a variety of other economic sectors. Furthermore, the arts and humanities have a unique role to play in supplying the breadth and depth of cultural content that powers the sector. Indeed there is now compelling evidence that innovation in the provision of this cultural content, combined with digital and technological skills, are together driving higher rates of growth in the creative economy than in many other industrial sectors.

The UK boasts a world-leading position in both arts and humanities research and the creative economy. Realising fertile connections between the two is neither inevitable nor easy however. Over the last several years the Arts and Humanities Research Council (AHRC) has led the way in supporting interdisciplinary research for, with and on the creative economy.

A key objective has been to bring together researchers and creative organisations and businesses to develop dynamic ecosystems across the UK – ecosystems that provide the infrastructure for future growth. In 2012, the AHRC invested in a four-year, £16 million, developmental programme that established Knowledge Exchange Hubs based in Bristol, Dundee, Lancaster and London.

- Collectively these Hubs drew expertise from 29 universities from across the UK.
- They supported 273 creative economy projects and connected 320 academics from over 50 disciplines with 350 business and 171 third sector organisations.
- They generated 436 academic outputs, developed new research methodologies, and built significant new capability in copyright and IP, improved contracting, and enhanced collaboration between PhD researchers and the creative economy.
- The programme has already had direct measurable impacts in the creative economy including creating at least 208 new jobs and 17 new companies; leading to 494 innovative products and services. It has helped small and micro-businesses secure an additional £4.5m in financial support and upgraded skills in the sector.

The main learning points from the programme include:
- the pivotal role played by local and regional networks in the creative economy;
- the unique position of universities within these networks – being able to provide both hard and soft benefits to micro and small enterprises especially;
- the essential role of arts and humanities research in creating new knowledge and skills and providing a breadth and depth of cultural content for the UK creative economy;

Left: REW is a fabric shot of a design based on Beethoven’s 5th Symphony. Courtesy of Beatwoven.

Right: Stackable creature, Yogscast Lalnalion. Courtesy of Beasts of Balance.
AHRC invested £16m in four KE Hubs for the creative economy (2012 – 2016)

- 273 creative economy projects operating in parallel with an intensive research agenda
- 1700 Number of innovators engaged with
- £4.3m Delivered into creative and cultural organisations

Outcomes and Impact

- £4m further funding for businesses
- £31.8m further funding in academic research and training
- Improved collaboration between universities and the Creative Economy
- New and novel approaches to IP and contracting
- Strengthening the role of universities within regions and place

The four KE hubs have benefited both universities and creative businesses. They leave a powerful legacy in terms of collaborative partnerships and new ways of working. Collectively they’ve achieved a significant and systematic step change in how the creative economy sector engages with the UK research base. They have demonstrated how universities are uniquely placed within local creative ecologies as trusted public institutions that are rich in skills and physical and intellectual assets.

The AHRC has a unique leadership role in connecting the UK research base and the UK’s creative economy. It acts as an independent broker, investing in new collaborations and partnerships and leveraging further resources from universities themselves and from a variety of other funders. The learning from the Hubs and other major AHRC initiatives for the creative economy now needs to be spread throughout the HEI system. Building on the Hubs’ successes, we intend to launch a scaled-up and even more ambitious programme that will produce new research and new forms of engagement with the creative and cultural industries in the UK and worldwide.

- the fundamentally collaborative nature of project development as characteristic of these disciplines.

CREATIVE EXCHANGES  THE AHRC KNOWLEDGE EXCHANGE HUBS FOR THE CREATIVE ECONOMY REPORT
This report summarises the results of a pioneering investment to bring together arts and humanities research and the creative economy.

The cultural and creative industries are a large, expanding and increasingly important part of the UK economy. They are growing at a rate faster than the whole of the UK economy.\(^1\)

In 2014 the UK’s creative economy was worth £133.3bn GVA (Gross Value Added)\(^2\). It comprises a vast number of knowledge intensive businesses and promises to drive future productivity and growth: employment in the sector increased by 5.1% from 2013 compared to 2% across the entire UK economy; 59.9% of jobs in creative occupations are held by graduates compared to 32.7% in other sectors. Multiple creative clusters are also powering regional regeneration and development with 73% of creative occupations held outside London and the South East.\(^3\)

The creative economy is, by definition, driven by innovation and new knowledge. University research is a primary source of that knowledge, and UK universities have long held a leading position in global research. Arts and humanities research generates new ideas, creates new networks and nurtures talent development that drives the UK’s competitiveness and success on a global scale.

The UK boasts prominence in both arts and humanities research and the creative economy; however, hitherto these have not engaged with one another organically or in any systematic way. Hence in 2012, the AHRC intervened to bring the two together in the form of a £16 million programme that created new Knowledge Exchange Hubs in Bristol, Dundee, Lancaster and London. In every case, the geographical reach of the projects went well beyond the cities in which they were based.

The Hub programme attempted to support breakthrough research and knowledge exchange in an industry where much innovation tends to be short-run, agile and experimental, and prone to failure, in contrast to university research which is often long-term and focussed on different types of output.

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Over a four-year period, each Hub developed its own distinctive approach to brokering new partnerships and testing new models of support for research-based collaboration in ways specifically tailored to the knowledge and skills needs of their creative economy partners. The four Knowledge Exchange Hubs for the Creative Economy were:

**The Creative Exchange (CX) – Lancaster**

The Creative Exchange brought together pioneering companies and the best academic thinkers to explore the potential of what is being termed Digital Public Space. Through new products and services, user experiences, and business opportunities, their goal was to encourage, enable and empower the creation of digital content for public services and creative businesses.

**Creativeworks London (CWL) – London**

By developing a consortium of 43 London-based universities, museums, cultural institutions, and SMEs, Creativeworks London brought new collaborative research opportunities to London’s creative businesses. Together, they researched and examined how knowledge exchange can work in practice to give businesses a competitive advantage through outstanding innovation.

**Design in Action (DiA) – Dundee**

Design in Action endeavoured to embed design-led business innovation into the Scottish economy, thereby opening up new pathways for business growth and development across Scotland. The hub brought together all of Scotland’s art colleges for the first time in this collaborative knowledge exchange programme.

**Research and Enterprise in Arts and Creative Technology (REACT) – Bristol**

REACT supported researchers in the arts and humanities to work with creative enterprises in collaborations that championed knowledge exchange, cultural experimentation and the development of innovative digital technologies. Through building new collaborative networks, the project brought new products to market and drove new research agendas within academia.

Without such a major funding programme by the AHRC, these collaborations simply would not have happened on this geographical scale, nor reached as many universities and creative organisations as they did.

The Knowledge Exchange Hubs (hereafter KE Hubs) were an innovative exercise in collaborative research. The return on investment that the AHRC was looking for was impact on both Universities (in terms of research excellence, institutional change and career development) and creative businesses (in terms of innovation and sustainable success). More importantly, we wanted to learn about how universities and creative businesses work together. We have learnt a lot. Many of the outcomes from the Hubs are still coming to fruition and the full extent of their impact is yet to be realised. This report sets out the most important findings and achievements to date.
Red Ninja began as a tech start-up with only 3 staff and little experience of working with academia or local authorities. However, following direct engagement with the Creative Exchange hub’s Open Planning project, Red Ninja today employs five times as many staff and has significantly increased its turnover by eleven-fold.

Investigating current limitations regarding engaging with the public in the urban planning process, the project developed new systems using narrative processes and digital technologies to visualise and better articulate design proposals, making them easier to understand. Using this process a new digital portal and app was developed allowing the public to engage in local council planning decisions.

Creative Exchange enabled Red Ninja to collaborate with Liverpool University academics, Liverpool City Council and two Creative Exchange Doctoral Researchers from Lancaster University on the project. Red Ninja’s CEO Lee Omar noted that ‘having direct access to work with a local authority in a paid capacity gave us confidence and credibility, which enabled us to design and develop a solution that enables more visibility for citizens living in urban environments.’

The project also significantly shifted the business practices of Red Ninja and their approach to collaborative work. Having experienced fruitful collaborations with research focused academics, the company is now using a research centred approach to investigate the challenges of accessing public data that were discovered during their Creative Exchange project. Using this approach Red Ninja intend to develop new processes and platforms that facilitate access to public data and allow organisations to use this data for purposes such as capacity planning.

The company is also continuing the collaborative approach to work, incorporating a programme of sponsored PhD students embedded within their practices which will develop their own research arm, and further research with the Creative Exchange to inform and build capacity in the sector.

As a result of this collaborative project, Red Ninja have created value; both commercial for their business and environmental value in terms of energy sustainability. The commercial value helped Red Ninja grow their business and work with new customers; whilst the environmental value created has enabled a major energy company reduce urban energy efficiency.

“The Creative Exchange process was fantastic for us as we invested much more of our own time into the project to enable us to produce IP that we could commercialise. The learning of working with the city data sets as part of the Creative Exchange has enabled us to design and develop commercial products with a multinational energy company on a smart energy platform that will enable sustainable urban developments. Commercially this was valuable to us and is worth ten times the financial reward than the Creative Exchange project. Working with Creative Exchange has been a significant springboard to growing the business”.

Lee Omar, the CEO of Red Ninja (software company)
Bill Sharpe, from the International Futures Forum, notes that industrial policy has moved from ‘picking winners’ to ‘providing enabling conditions’; those being ‘healthy markets, liquidity,… funds for investment,…business incubators, and fluid relationships with research centres and Universities.’ The goal, he maintains, is to produce ‘a healthy creative ecosystem.’

Creative ecosystems come into being when different sectors are brought together through new networks and clusters. For example, the AHRC-funded Brighton Fuse project report *The Brighton Fuse* (2013), which connected the arts, humanities and design with digital and ICT, found that businesses which ‘fused’ these disciplines experienced high growth.

Creative clusters and networks are particularly important for a sector largely made up of agile freelancers and small and micro businesses. The clustering of people and businesses allows for the sharing of new ideas, people and skills through proximity or co-location. This, in turn, leads to increased business activity as well as the development of new businesses. A report from Nesta

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“Creative Exchange have been very supportive in progressing my idea to prototype stage. While the funding itself was to bring an idea to prototype stage, I have received more than a prototype which has added great value to my business. The value, I believe, has been in making the right connections and meeting the right people to support my business. This is so important in every entrepreneur’s journey”.

Michelle Hua, MadeWithGlove (a wearable technology company)
The location of the universities and formal project partners involved in the KE Hubs programme by organisation type (AHRC, 2016)

Organisation Type
- Holding Organisation
- Partner Organisation

Type of cluster
- High concentration and growth
- High concentration
- High growth

Source: ONS, Business Structure Database; Nesta analysis.

Universities play a crucial role in creative ecosystems because they help freelancers and microbusinesses, who often lack the capacity, connectivity or resources to undertake R&D themselves. As the 2013 Witty Review of Universities and Growth shows, UK universities nurture and sustain local networks and clusters. They provide access to highly skilled people, knowledge exchange, training and dissemination as well as supporting incubation and spin-outs.

A primary activity of all four of the KE Hubs was to use the arts and humanities resources of their universities to strengthen local creative ecosystems, and to help creative enterprises work with universities. They invested in projects connecting arts and humanities researchers with creative and cultural businesses in order to accelerate growth and innovation and to foster entrepreneurial talent. They also connected innovators with trusted networks of advisors and financial support.

The KE Hubs established new methods of knowledge exchange through Chiasmas, Ideas Labs and Sandboxes. In particular, the Hubs successfully developed models of engagement for small and micro businesses that have not traditionally engaged with academic research. They brought together 29 universities, and connected over 50 academic disciplines with more than 1700 innovators.

The hubs supported 273 creative economy projects operating in parallel with an intensive research agenda, drawing in over:

- 350 businesses
- 320 academics
- 171 third sector organisations

The AHRC’s KE Hubs were located both in urban creative hotspots, such as London and Bristol, and in more rural areas, such as Aberdeenshire, North Lancashire and South West England. But they also had reach far beyond their base. Critically, it was found that different approaches to network formation are required in different geographic circumstances.

**The Hubs engaged with:**

“FACT has been a major collaborator with the Creative Exchange (CX) network. Right from the start, we recognised the potential value of bringing academic and research expertise into the dynamic environment of innovation in the digital arts… CX has been instrumental in FACT’s development of its own innovation labs including FACTLab”.

Mike Stubbs, Director/CEO, FACT (Foundation for Art and Creative Technology, a Liverpool based media arts centre)
Knowledge Exchange methods

Design in Action

Design in Action developed a bespoke workshop called Chiasma. A fast and intensive creative process that brings together selected individuals with the right skills, interest and expertise into a residential environment for two to three days.

During this time participants from a range of professions, including academics, business leaders and designers, use design to form new ideas in order to find solutions for societal challenges and translate these into market opportunities. Chiasma workshops are focused on five sectors identified by the Scottish government as having high potential economic growth; food, sport, rural, ICT and wellbeing.

Following the Chiasma workshop, participants have the opportunity to apply for further support in developing their ideas; this includes further funding; a license to exploit the intellectual property of an idea conceived at the Chiasma; and for further expertise and support in developing a product.

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**CHIASMA WORKSHOP**

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<th>Idea generation</th>
<th>Panel chooses idea for development</th>
<th>IP assigned</th>
<th>Idea developed by academics &amp; professionals</th>
<th>Market-Ready product</th>
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<td>• Academics • Designers • Business leaders</td>
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**REACT**

REACT’s primary method for supporting projects was the Sandbox methodology, which was delivered by a team of REACT Creative Producers. REACT ran five Sandboxes, each with its own theme; Heritage; Books and Print; Future Documentary; Internet-connected Objects; and Play. Themes were developed in consultation with creative economy advisors.

Ideas Labs were held across the South West and South Wales region, day-long sessions where creative businesses and researchers were brought together to generate initial ideas and form teams. Each team was led by one academic and one creative business. These ideas were then developed by university teams and REACT producers to bid for investment.

For each theme, a cohort of projects was chosen that represented a diverse range of skills, approaches and knowledges. In each cohort, teams were supported through a programme of workshops, events, and business development meetings, to develop prototype products or services. The whole process was co-ordinated by a Creative Producer with a supporting team of industry advisors, a specialist business mentor, PR and legal coaching. Projects were also supported in applying to next stage funding and investment by the producer team where appropriate.

REACT also delivered smaller schemes for projects, such as our Feasibility and Prototype Funds, and offered follow-on support for on-going collaborations through the Alumni Scheme.

**SANDBOX**

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<th>Cohort funded</th>
<th>Prototype developed</th>
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<td>• Universities • Producers • Teams</td>
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**Creative Exchange**

Creative Exchange (CX) projects were born primarily from CX Labs, one-day workshops around particular themes – a theme is identified in response to business-led scoping of the landscape of digital public space. Selected participants are a mix between three parties; UK arts and humanities academics, CX PhDs and businesses. During the workshop, groups form and generate ideas to develop a proposal for an R&D project they could collaborate on.

The CX Labs use a range of bespoke knowledge exchange tools and processes to develop discussion around the themes, develop a range of areas of opportunity and allow groups to form around particular ideas for collaborative work. At the conclusion of the CX Labs initial proposal drafts are submitted, which participants can then choose to develop further into a formal proposal for a three to six-month project.

**Creativeworks London**

Creativeworks London’s programme featured a series of event-based activities, with funding provided under four schemes. These entailed collaboration between one or more academic researchers from a higher education institution or independent research organisation and one or more entrepreneurs:

- The **Creative Voucher scheme** – enabled small and medium sized businesses to partner with an arts and humanities researcher from one of CWL’s partner institutions.

- **The Creative Entrepreneur in Residence scheme** – supported cultural, creative and creative digital sector entrepreneurs in a short-term residency with one of CWL’s research partners.

- **The Researchers in Residence scheme** – enabled creative and cultural companies to access specialist knowledge or expertise provided by a current or recently completed PhD student or early-career researcher.

- The **BOOST scheme** – provided further support to projects from the above schemes. BOOST was established to enable businesses and researchers to develop and/or commercialise their ideas through an additional research project that benefits both the SME(s) involved and the arts and humanities research base in London.
At heart, the driving force behind the knowledge exchange hubs was an ambition to forge links between organisations and individuals who might otherwise not consider themselves obvious collaborators.

In the case of REACT, over 560 creative companies and 300 academics were engaged. This resulted in 53 funded projects, featuring 57 businesses and 73 arts and humanities academics from local universities. These interactions created an aggregated network of talent able to innovate, develop collaborative ideas and solve challenges.

Crucial to the success of REACT’s collaborative vision was the partnership with Bristol’s Watershed, whose Pervasive Media Studio provided a neutral ‘third space’ where representatives of business and academia could meet in a collaborative and supportive environment. The use of the studio – a long-term collaboration between Watershed, UWE Bristol and University of Bristol – in turn allowed REACT to plug into an existing ecosystem of...
innovative activity with the Watershed at its heart, and connect with a larger network of businesses, private and public institutions across the city, region and even internationally. Through these connections REACT has been able to draw together a pool of producers and advisers from a rich variety of backgrounds including English Heritage, the British Council, Channel 4, the BBC, Disney UK, Aardman Digital and the National Theatre Wales. The resulting collaborations soon established a life of their own, moving beyond a simple two-way exchange between academic advisor and project partner, to a far richer ‘innovation ecosphere’ of multiple interactions between a host of other participants, which without REACT as a broker would not have been possible. Kinneir Dufort, an award winning design agency, recognised the advantages that REACT’s methodology could bring to existing business, commenting that ‘The REACT Objects Sandbox project provided us with an opportunity to prototype new ways of working on technology projects, which we deployed directly on a subsequent commercial project for the Huggies brand in Korea’.

Nowhere was this interconnectivity better demonstrated than at The Rooms festival held over three days in November 2015. As well as showcasing products and services developed through the REACT project, The Rooms also highlighted to a public audience in excess of 6,000 visitors the extent and influence of the creative economy by forging links with other creative organisations and networks from the South West and Wales.

The success of the REACT methodology can be seen in the example of the artist collective Stand + Stare, which engaged with the REACT network to develop Mayfly, a travel journal with the ability to record sounds and embed them within the pages of a physical book. As Stand + Stare’s co-directors Lucy and Barney Heywood put it ‘REACT brought us and Professor Tim Cole together, which has led to us setting up a business together as joint directors… we are embarking on a new journey and are incredibly lucky to have REACT there supporting us and guiding us!’ The team credits REACT for giving them space and time to explore and grow the ideas coming from their collaboration. As Lucy says, ‘we had no idea this is what we were working towards’ but ‘getting to think in a way we didn’t know we could think’ has enabled the team to develop a core business in a wholly new way, injecting new energy and skill sets into their work.

The model used by the REACT Hub to develop localised networks is now being recreated and refined to establish further regionally-based networks such as those in Cardiff (see case study on Creative Cardiff), Bristol (Brigstow Institute) and Exeter (Kaleider). These networks build on the REACT methodology to further stimulate the creative economy nationwide through creating opportunities to share ideas, solve challenges, provide peer critique, and offer encouragement.
CASE STUDY

PLAY SANDBOX

REACT Play Sandbox gives creative businesses a unique insight into their product development

To facilitate academic–business collaboration REACT was organised around five themed ‘Sandboxes’. Addressing Heritage, Books and Print, Future Documentary, Objects, and Play. Each Sandbox related to a business sector considered in need of research and development to respond to the disruptions of technological innovation.

‘The sandboxes have been a great resource’ – notes Tomas Rawlings, CEO of Auroch Digital – ‘when we started, someone commented that we should make the most of this because it’s an opportunity that won’t come around again. It’s completely different to the commercial process, which is about making quick decisions to hit deadlines. Here we have to take our time, try different approaches and experiment...’

Of the five, the ‘Play’ Sandbox offers a particularly interesting insight into how the process worked and evolved to meet the specific needs of its participants, and how these lessons can be adapted to broader situations. REACT’s Play Sandbox was created to develop new products and services for children. Bringing together companies and academic researchers to develop prototypes that re-imagined play in new and transformative ways, it also broke new ground by integrating a team of 8–12 year olds into the design process at an early stage. Acting as ‘young coaches’ alongside the usual adult producers and business mentors, their involvement allowed each project to engage directly with its target audience. As fewer than 5% of children’s toys are actually tested by children, the Play Sandbox went one step further by introducing children to the design of products for the first time. The involvement of the young coaches provided participants with a rare R&D opportunity not usually available to cash-
strapped start-up companies working to tight deadlines.

Through its exploration of the chaotic, exciting and disruptive contribution children can bring to the collaborative process, the Play Sandbox became a space of R&D not only for its projects but also for REACT. Research commissioned from Dr Helen Manchester and Alison Oldfield at the University of Bristol to assess and evaluate the role of the young people in the process suggests that REACT has broken new ground in managing co-creative processes and has important lessons to offer to the UK’s wider creative economy. This academic assessment certainly seems to be shared by the businesses that evolved from the Play Sandbox. As Cara Jessop, of Enabling Play, put it ‘these ways of working which were intrinsic to the Sandbox have absolutely had an impact on the values of Enabling Play – our emphasis on products well-grounded in research, tailored specially to our audience through careful ongoing co-design sessions with volunteers, and our general spirit of openness to sharing ideas and bringing others into our participatory design processes (whether they be creatives, academics, children, parents, teachers...).’

Most of the six projects supported by the Play Sandbox have entered production phase and two have since launched into the market place following private sector investment of over £1.6 million (see case studies on MekaMon and Beasts of Balance). Each of the participating companies has benefited from this involvement and used the experience to enrich their processes and products.

“Product development has a life cycle of prototyping, testing, manufacture but Play Sandbox had a built in feedback loop which was really important…. Being able to have an opinion at every stage and not second guessing, I think every company should be doing it”.

Silas Adekunle, Reach Robotics (a gaming robots company)
What universities bring to the creative economy

As public institutions, universities are blessed with good reputations, long histories and – compared to small creative businesses – are rich in physical and intellectual assets. They can therefore provide a variety of hard resources (such as contacts, spaces, and intellectual input) and soft benefits (for example, access to networks, advice, reassurance, encouragement, and stability) to creative economy partnerships.

Skills and knowledge
The Hubs offered creative and cultural businesses the opportunity to unlock the research held within a university through the co-creation of ideas, processes and products. They shaped new methodologies, such as Sandboxes, to co-design products and services, and, in addition, they helped creative economy partners to better understand their users and audiences.

Networking
Because they are themselves well connected, universities can give the creative industries access to an extensive field of research, financial, governmental and other networks at regional, national and international levels. The Hubs capitalised on these opportunities to host a series of events and conferences bringing together a wide range of stakeholders, including practitioners, academics, policy makers, funders, business partners and other interested parties to discuss areas of mutual interest.

For example, the Design in Action hub hosted an annual Scottish Design Summit to showcase the potential in Scotland of a future design-led economy. The event included speakers from Rolls-Royce, Spotify, Harris Tweed and Diageo, which enabled businesses that were supported by the hub to access new clients and test their products in the public domain across Scotland and the UK.

The KE Hubs hosted regular forums for cohorts of projects. This enabled the sharing of entrepreneurial skills amongst academics and businesses – an invaluable opportunity for project partners who were able to strengthen and deepen their engagement, as well as to build new contacts and connections.

“The project did provide us with the opportunity to work with experts we wouldn’t otherwise work with and so we now feel able to call upon these new contacts for potential future projects where their expertise would be of value”.

Ian Wareing, magneticNorth (Independent design studio)

“REACT has had (and is still having) a huge impact on our work and our future. Support through pump priming, feasibility and now the alumni scheme has helped us to develop our project Mayfly, which will soon be a new company. REACT brought us and Professor Tim Cole together, which has led to us setting up a business together as joint directors, and also working together on another project through the University of Bristol. We are learning a host of new skills, from app and book design to entrepreneurship and understanding retail. We all feel like we are embarking on a new journey and incredibly lucky to have REACT there supporting us and guiding us as we take flight!”

Lucy and Barney Heywood, Stand + Stare (an immersive theatre and interactive design company)

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The Creative Entrepreneur in Residence (CEIR) initiative was developed to support entrepreneurs who are interested in undertaking a short-term residency with one of Creativeworks London’s research partners. One of the 31 CEIR was Rob Sherman of creative business Bonfire Dog. He partnered with the British Library to produce an original body of artistic work in reaction to the ‘Lines in the Ice’ exhibition, which focused on the 1845 expedition by John Franklin to discover the Northwest Passage. The residency also enhanced the public engagement elements of exhibitions whilst additionally influencing the internal culture of the British Library.

This collaboration brought together the different expertise of staff at the British Library along with the artistic expertise of the entrepreneur. One of the key elements to the partnership was the support provided by Rob Sherman to the ‘Lines in The Ice’ exhibition which was extremely successful, attracting over 100,000 visitors. Partnering with a creative entrepreneur has also altered philosophies and practices amongst the curators of the British Library especially in terms of talking about, researching and displaying artefacts. Stella Wisdom from the British Library states ‘The residency not only provided an alternative perspective on historical events covered in the exhibition, but it also challenged the Library’s internal culture; questioning its own practices and appetite for innovation’.

A series of high quality artistic contributions to the Creative Economy were produced as part of the residency utilising both the knowledge exchange elements of the project, collaboration with the various professional elements of the Library and access to the Library’s knowledge assets. The artistic work includes a hand-bound book, a hidden web server at the Library, early prototypes of digital games and a research blog. In addition to these outputs the residency led to the reinterpretation of traditional music using the Library’s Sound Archive as inspiration. The reinterpretations were recorded at the Library’s recording studio for open-access upload and were performed at several events.

Rob Sherman highlights the benefits of the project to his career and work by stating: ‘These are methods I will continue to use in my future work.’ Not only has it supported Rob’s work as a creative entrepreneur the contacts and skills he learnt are being used to develop his career. As he states again, ‘contacts made during my time at the British Library have led directly to my AHRC-funded PhD at Bath Spa University.’ The project has also led to further funding from the Eccles Centre for North American Studies to support the residency.

Brokerage
The KE Hubs also brokered access to other academics across the universities from a range of disciplines relevant to the specific needs of the project. Facilitating interdisciplinary interfaces across creative, digital and technological expertise is not easy but the creation of these connections and the fusion of skills are crucially important to the UK economy.

Trust and collaboration
The Dowling Review of Business University Collaborations (2015) argues that strong long-term relationships are built on mutual benefit with trust at the core of every partnership.

Collaboration was at the heart of every Hub’s activity ensuring that each business/university partnership provided mutual benefits to both the creative enterprise, (through new ideas, processes and products) and to the academic partner (through impact, new research and teaching).

A ‘third space’ that reduces risk and promotes innovation
The KE Hubs highlighted the importance of a ‘third space’ for knowledge exchange. Micro-businesses, especially, need the rare commodities of time and space for R&D activities. The hubs provided both, investing in the collaborative R&D to support access to expert knowledge and skills for the productive exploration of new ideas.

Research disciplines engaged in hub activity

For example, Watershed, an arts and innovation centre in Bristol, and a partner in REACT, is independent and neutral from both the business and university sectors. As the AHRC-funded Beyond the Creative Campus report evidences, independence of this sort enables true co-creation because neither party can exert authority over the other. The Design in Action hub created a digital ‘third space’ providing non-academic collaborators with an online platform and a safe space to network and share ideas free from the concern of academic or university influence.

Staff at Nexus Productions noted the value of their Creative Exchange project in “…allowing us to experiment and try things in a low-risk environment”.

“I valued the experience of working within the context of a project influenced by a third party organisation. This enabled me to develop skills in working with agendas not normally encountered in my own academic research. I thus developed new methodologies of planning, undertaking and producing research. In addition, the involvement of technological disciplines provided me new insights applicable to my own discipline but which (without this project) I was previously unaware of”.

Oliver Wilkinson, Research Assistant in History, University of Central Lancashire
What specifically have the hubs achieved?

Over the past four years (2012 – 2016) the individual KE Hubs have had a great deal of success. Collectively they have achieved significant impact and return on investment for the universities and the creative economy sector. However, four years is a relatively short time in the lifecycle of any major new endeavour. The more fundamental impacts from the four KE hubs will only become clear over the next decade. The data gathered so far shows that:

**Investment in new research**

As a result of the initial £16m AHRC investment in the KE hubs, £31.8m of additional funding has been raised for new university-based academic research and postgraduate training, all based on work originating with the hubs.

The KE Hubs have invested in academic research and training that support their knowledge exchange activities. This has led to a better understanding of new business models for the creative economy, the role of intellectual property in cross-sector collaboration, and the benefits of knowledge exchange for small and micro enterprises. Together the Hubs have published 436 academic outputs, including journal articles, monographs and working papers.

**New products and services for business**

Through collaborative projects, the KE Hubs invested £4.75 million of their original funding in R&D activities to support a wide variety of creative and cultural organisations.

This investment contributed to the development of over 494 innovative outputs, of which 192 products or services have been launched into the market, including devices, software, hardware, platforms, methodologies and services. Specific examples include the world’s first robotic gaming system, Mekamon, UAN Wool’s Allergy UK accredited luxury pillows, and a graphic interface for clinicians and kidney patients.

To date, the Hubs have also helped small and micro-businesses to secure a further £4.5 million in investment as a result of their engagement with the hubs.

“We spoke with the team, who came from Publishing, Journalism and Law backgrounds, and it was agreed that the team would operate with a process of collective responsibility where all input is welcome and there is no one decision maker. Customer interactions and our thinking are very much influenced by design methodologies and co-creation”.

*James Brown, Founder of Beer 52 (a craft beer distribution company)*

“Tim Jones (Creativeworks London) was an ideal partner for a collaborative project as he fully understands the potential and the limitations of such partnership. The chemistry and trust that was sparked at the first meeting continued throughout the 6 months of the project which was not simply two contractors working to a schedule, but a give-and-take partnership. I would be delighted if given a future chance to work with Tim”.

*Mick Grierson (City)/Heart n Soul (a creative arts company and charity with a focus on learning disabilities)*
The REACT KE Hub has enabled Bristol start-up business ‘Reach Robotics’ to work with arts and humanities researchers in the field of play and gaming theory, and helped the company to attract Silicon Valley venture capital investment.

Reach Robotics created MekaMon, the world’s first customisable, battling robots, controlled by the users’ smartphones. Through REACT, Reach Robotics was able to collaborate with researchers at the Digital Cultures Research Centre at UWE who explore how players understand and engage with games. As a result of the REACT programme, Reach Robotics and the Digital Cultures Research Centre were able to work directly with users throughout the design and development of MekaMon.

Following involvement with the Play Sandbox in 2014, Reach Robotics initially drew upon the funding opportunities provided by REACT to establish the company, which now employs ten people and is continuing to grow. MekaMon launched a presales campaign in November 2016 to bring its product to market in time for Christmas, with plans to scale up production through 2017.

Reach Robotics was one of ten robotics companies to have been accepted onto the prestigious Qualcomm Robotics Accelerator, an intensive start-up programme supported by Techstars. Further recognition came in 2015 when the company was selected as one of the UK based start-ups to accompany HRH Prince William on his ‘Innovation is GREAT’ campaign trip to Japan and China.

Silas Adekunle, CEO of Reach Robotics, was clear about the value of the collaboration facilitated by the AHRC funded REACT KE Hub: ‘Collaborations of this sort are quite rare in the field of robotics and I have found them to be invaluable. We’ve now got more robust prototypes because we had users testing and informing our design process, with research input at every stage. We’re in a stronger position with the products because of this approach to knowledge exchange… REACT’s funding and unique approach to knowledge exchange has provided me with access to high quality research, business support, and sustainable professional relationships that have helped me take my company from start-up to investment.’

Through a combination of design-led process, academic research, financial support and professional mentoring, Design in Action helped to create the successful Scottish natural bedding company UAN Wool. Since sheep farmer and entrepreneur Julie Hermitage brought her idea to Design in Action’s ‘Rural Chiasma’ in June 2013, UAN wool has displayed at the Royal Highland Show in June 2015 and 2016, received a Scottish Rural Award for ‘Best Start Up’ and have been covered by the national press.

With Design in Action’s support UAN wool has successfully created and brought to market a bedding product that is breathable, temperature regulating and suitable for allergy sufferers. Julie brought her idea to Design in Action’s ‘Rural Chiasma’ event where she learnt more about the design process and met individuals who could help develop her idea into a professional product and brand. As well as an initial cash injection of £20,000, Julie was offered an intensive programme of business support that included market research and expert input from textile and graphic designers. Through taking part in this process, Julie was also awarded an ‘innovation voucher’ from the Scottish Funding Council worth £5000 allowing her to work with Dr Lisa McIntyre at the school of Textiles and Design at Heriot Watt University, using specialised machines to conduct research into the antimicrobial qualities of wool.

The design-led approach fostered by Design in Action has been instrumental in supporting UAN Wool to develop a product range that is beneficial to health, the environment and the Scottish economy. The process has not only supported the success of a new business but also seized the opportunity to conduct further research into wool as a sustainable and useful material. Design academics worked with the project to engineer a casing-free cushion and wool-cased duvet, therefore enhancing the antimicrobial and environmentally friendly benefits of the product.

Support has also been leveraged from the Scottish Biofuel Programme to explore how the wool can be used at the end of its product life as a compostable material; this has provided options to incorporate into the product’s design, making it more sustainable. With showcases at the Royal Highland Show and UK Government-backed Venturefest Scotland, UAN Wool continues to raise its profile as an advocate for design-led business.
An interdisciplinary collaboration supported and funded by the Creative Exchange has produced a much improved method of displaying blood test results that helps patients with chronic renal disorders to understand complex datasets, improve their relationship with medical staff and manage their health. The worlds of the medical profession and the arts rarely collide, but the collaboration between Lancaster University’s PhD student Jeremy Davenport and Heather Hill from Lancashire Teaching Hospitals NHS Trust, shows just how fruitful such interactions can be. The Creative Exchange collaboration brought together Adrian Gradinar (PhD student) and Professor Paul Coulton who helped support Hill and Davenport turn an innovative idea into a working prototype. The diverse skills and expertise of the team guided them through the challenges and difficulties whilst also providing the necessary space and time to ensure the collaboration was successful.

Inspired by the opportunities that design practice could offer to his clinicians and fellow patients, Davenport was aware of the potential to improve how regular blood results could be visualised to support both patients and medical staff share knowledge. ‘I knew we could do something that would really improve how that data was visualised and wanted to create a tool for the clinicians and patients to work together to begin to really help them understand what these important blood tests were all about.’ Hill worked closely with the team bringing her clinical expertise and experience from Lancashire Teaching Hospitals to the fore in the development of the prototype ensuring that innovative design was combined with clinical good practice. Once the initial model was developed she worked with a group of patients and their carers to co-design improvements to the prototype and evaluate it. The Creative Exchange team is currently working with the renal IT manager at Preston Royal Hospital to explore how the prototype can be deployed to support a clinical study evaluating its utility and impact.

It is anticipated that following a successful trial, the prototype will be rolled out to encompass more detailed results within the blood tests – a prospect that Davenport finds exciting: ‘Really, the project is to provide a tool that will help clinicians work with patients, their families and carers... we realised we could actually extend the methodology we were using to include more metrics. It’s really important for patients to know what’s going on, and if they’re not happy, to ask questions. It’s really powerful from a patient’s perspective because you become empowered and an active partner, working with your clinicians in managing your own health.’

Hill’s clinical experience and expertise was also vital in highlighting the need for this new method of displaying results, ‘If patients feel empowered and they understand what the blood results mean, it helps them to make appropriate changes to their diet.’ Between them, the Creative Exchange team pooled their very different specialisations with vital support from the Creative Exchange Hub to produce a tool that has the potential to offer significant benefits to both renal patients and medical professionals. Beyond this, they have demonstrated how collaboration between the arts and the sciences can provide exciting new ways to improve communication between doctors and patients, simplifying and demystifying clinical data across a whole range of potential conditions.

Jeremy Davenport, Lancaster University.
Growth in the creative economy
The KE Hubs have supported the development of at least 17 new spin out companies, with more soon to be launched, and created at least 208 new jobs.

Changing university practice
The KE Hubs have already produced a cultural shift within existing university processes and procedures. The Dowling Review identified Intellectual Property (IP) and contracting as the two main barriers to university/business collaborations. The review went on to state that ‘IP and other contract negotiations are difficult to complete, processes difficult to navigate, or take too long’.

The Hubs developed more streamlined and agile contracting and payment processes, which has enabled the universities involved to work with small and micro businesses more efficiently and effectively. These processes could now be replicated in other universities.

They also successfully tested new and novel approaches to IP, which again could be more widely adopted. For example, Design in Action operated an IP shelter in the form of a co-creation space that initially allowed businesses to operate within a safe and secure environment within the university, and then allowed project partners to license back IP at no cost if they wished to commercialise or exploit it.

CASE STUDY

INTELLECTUAL PROPERTY MODEL

New approaches to Intellectual Property facilitate product development for SMEs

Design in Action have developed a ground-breaking approach to Intellectual Property (IP), enabling university-based experts and industry professionals to work together on new innovation while ensuring that the ownership of the idea is protected. The approach is particularly suited to industrial partnerships within the arts and humanities, which are more likely to involve SMEs than larger businesses. It meets a need that was not catered for by existing IP approaches, which tend to cater for the fields of Science, Technology, Engineering and Mathematics and are directed towards working with large corporations.

The model draws on Design in Action’s ‘Chiasma’, events which brought together individuals from a range of professional backgrounds to work together exploring new ideas in the context of market need and opportunity. Ideas developed by Chiasma participants were initially held in an ‘Intellectual Property Shelter’, owned by the University of Dundee. Following the event, new project teams could then take forward any product ideas developed and competitively bid for the IP – if successful, the University would grant an IP license.

This approach is beneficial to both the university and the new business. The IP is licensed free of charge and, once the new product reaches market, the IP is assigned to the business. The university in turn takes a profit share, which helps to maintain a strategic relationship and eventually replenish the Chiasma funding pot. This approach offers a sustainable business model that encourages product design to be embedded from initial conception to prototype.

Jason Morenikeji attended a food themed Chiasma in 2014. His product idea ‘Table Farm’, a ‘Tamagotchi’ style design encouraging pre-teen interest in food production, benefited from use of the IP Shelter. The company are now at the point of taking ownership of the IP having made use of IT asset and commercial asset expertise provided by the University, which has supported Table Farm in becoming a registered trade name. Jason states that Design in Action’s handling of the IP ‘offers small businesses much needed commercial protection and confidence.’

To Design in Action’s knowledge, this is a unique IP approach that has not previously been utilised by universities. Its scale, structures and reputation for public good and service means the university is ideally placed as a trusted intermediary for business, protecting and deterring any threat to market position. This method for collaboration between publically funded institutions and private enterprises offers exciting possibilities for the future role of Higher Education Institutions in innovation.
“The scheme made me a better listener, a better exchanger of knowledge and a better businessman”.

Ross Miller, Decoded Collective (a creative technology company)

an idea. Retaining the IP within a university shelter provided small and micro businesses with significant confidence and protection.

**Talent development and new approaches to capacity building**

The hubs nurtured a new generation of PhD students and Early Career Researchers through facilitated knowledge exchange activities. For example, Creativeworks London’s Researcher-in-Residence scheme supported 22 projects which allowed researchers to respond to real-world research needs while also providing small cultural and creative companies with access to appropriate and targeted research expertise that addressed a specified research and/or business need.

Creativeworks London also hosted a Creative Entrepreneurs-in-Residence scheme, supporting 31 projects, that provided creative and cultural entrepreneurs with the opportunity to undertake a short term residency at a host University to enhance their understanding of a particular subject area or market, and access a wealth of knowledge complementary to the environment in which they operate on a day to day basis.

The Creative Exchange hub successfully piloted a new form of doctoral training. Through practice-based knowledge exchange PhD work, students were engaged in a series of mini-projects, with academics and companies as the collaborators and facilitators. This new mixed-mode approach combined theoretical enquiry with real-world application in real-time. This methodology, innovative in itself, produced a cohort of trained ‘hybrid academics’ who are comfortable working within an academic environment and a business-oriented knowledge exchange context. This new PhD model has been adopted by the three HEI partners in Creative Exchange.

All four KE Hubs recognise the importance of ‘knowledge brokers’ in supporting new collaborations. One example can be seen in the role of the Creative Producer – a key to the success of REACT’s research and development methodology. Creative Producers have a role throughout the collaboration, from the development of R&D themes, to supporting a team’s development, to project completion, and beyond. The Creative Producers translate, facilitate, challenge and care for the project teams in order to yield greater results. In recognition of the success of this role, two of the REACT partners, University of the West of England and Watershed, are designing a collaborative new Masters programme, to be launched in 2017, to train Creative Producers for the Creative Economy.

**Exploring the intersections between creative and digital**

The hubs explored the ever changing digital landscape and its transformative impact on the creators, publishers, distributors and users of digital technology. They worked with the BBC and national museums and galleries, such as the British Library, to inform new thinking and content in the digital public space, as well as with micro and small creative businesses to explore the use of digital technologies to connect with new audiences; provide platforms for the consumption of content; and consider new ways of understanding digital assets.

“The biggest output is that given the confidence from the residency to employ graphic designers, we now employ three full time, and have a freelancer too (and we are wondering about expanding to four graphic designers). This has been an extremely fantastic experience for us as a company, as we have been able to take on more work, and ultimately have expanded the company, and make more profit”.

Nissen Richards Studios, (Architecture studio)
A cohort of 21 PhD students has benefited from the Hub’s unique hybrid approach to doctoral training, where each student carried out several placements enabling them to put theory into practice working for commercial and public sector partners. As a result the students have developed a skillset which is highly sought after in innovation industries.

For Lara Salinas, a Creative Exchange doctoral student, the Hub’s distinctive PhD model has shaped her career to be more focused on partnership and collaboration. In her research on the potential of the digital public space to enhance lived experience of urban public spaces, she has worked with creative companies, local authorities, citizens and academics from a broad range of disciplines. This has helped her to establish a network of contacts which gives her work more visibility, paving the way for her to secure commissions and consultations with local government. She is now drawing on this expertise to contribute to an AHRC-funded service design project, seeking new ways to meet the challenge of improving outcomes for citizens in the face of significant reductions in central Government funding. Her work on this project, a collaboration between the London Borough of Camden and Central Saint Martins, builds directly on her doctoral experiences of fostering partnerships between higher education and local government.

The Creative Exchange PhD model has left a lasting legacy within each of the three participating institutions, who now offer PhD students a range of placement opportunities in the creative industries. The model was the foundation for the EPSRC funded Centre for Doctoral Training (CDT) in Digital Civics at Newcastle University, which will be offering 11 new PhD studentships per year over a period of 5 years. In addition to creating a new format for doctoral training, the success of this model is having an impact on research into approaches to collaboration and partnership within the public services sector. The Creative Exchange legacy includes other public sector partnerships. The £1.2million AHRC project Leapfrog at the University of Lancaster will result in new tools to facilitate closer collaboration between public sector and community partners.

The Creative Exchange PhD programme visualised.
New research methodologies shape innovative digitally-enhanced games
REACT funding and support transformed an initial concept into a workable prototype for a new tabletop game. With further support from the Watershed and the University of Bath development funding from the UK Games Fund and a successful crowdfunding campaign, Beasts of Balance (previously called Fabulous Beasts) was launched in November 2016 online and across UK retail stores including Harrods and John Lewis.

Beasts of Balance is a table-top game which combines physical objects and digital worlds to create a unique gaming experience. Players take turns in adding creatures and artefacts to build an ever-growing tower. The players place the beasts against the scanner before carefully stacking them onto the tower. This base links with a tablet or mobile device where the beasts populate a rich digital ecosystem, complete with beautiful graphics and sounds. The way pieces are played on the table top changes the ecosystem in the digital realm. Players can play together to create a world that is in harmony both on screen and in the real world.

Reviews of the game are glowing, with it being featured amongst The Guardian’s ‘25 most anticipated video games of 2016’, and the LA Times reporting that it ‘completely reinvents the game of balance’.

Fundamental to the development of Beasts of Balance was the opportunity to bring together skills and research in games design, storytelling, industrial design, mechanical engineering and prototyping and creative methodologies through the REACT Hub. Uniquely, this process also included input at an early stage from Young Coaches, a selected group of children invited to participate in the Play Sandbox (see case study). This process fused together an innovative mixture of academic insight into the creative process within design and manufacturing, business understanding of games design and creative entrepreneurialism, and R&D input directly from the consumer.

In order to commercially produce the product and market it to a global audience, the creative entrepreneur, freelance games designer Alex Fleetwood formed the company, Sensible Object in 2014, which currently employs six people. Within months the first version of the game was receiving an enthusiastic reception at a range of international industry events, culminating with winning the 2015 Best Augmented Reality game award at Indiedcade, a leading independent games festival in New York. As Alex Fleetwood noted the game “would not have reached this point without the AHRC”. The full product range of the company now features variants of the stackable objects and includes four discrete product variations of the game.

Working with the project had benefits for the academic partner too; Dr Dekoninck’s involvement with this project was instrumental in her securing an EU Horizon 2020 grant on spatial augmented reality in co-creativity.

The project, a recipient of development funding from the first round of the UK Game Fund was highlighted as a success by the Minister of State for Digital and Culture Matt Hancock MP at the launch of the third round of the UK Games Fund. The game is due to be launched in North American retail outlets in 2017.
Beer52 is Design in Action’s biggest success story to date. The online beer-ordering service generated £2m revenue in its first 18 months; today it is worth £4m with an annual turnover of £2.5m. It is an award-winning enterprise that continues to grow through attracting new investment.

The story began in Elgin in April 2013, when James Brown, founder of Beer52, attended Design in Action’s ‘Food’ themed Chiasma event. The event focused on using design to support the growth of the artisan food and drink sector in Scotland. Designers, academics and food producers came together to collaborate and develop innovative ideas; participants were then given the opportunity to form teams and bid for funding to commercialise their concept. Beer52 was successful in being awarded £20,000 to develop a prototype.

James is highly supportive of the Chiasma process: ‘Beer52 would not exist without that weekend in Elgin’. The Chiasma event gave James, whose background is in online marketing, the opportunity to test the idea for Beer52 with professionals from a range of different backgrounds. Initial ideas for the business model were fine-tuned with the contribution of design and academic research.

Beer52 launched in August 2013 through discount voucher website Groupon; it broke Groupon’s UK sales record selling out in 48 minutes; it is now the largest craft beer club in the country. Beer52’s business model has proved to be sustainable, attracting further investment including £180,000 of crowdfunding and a £45,000 award from Scottish Edge, a competition aimed at identifying and supporting Scotland’s up-and-coming entrepreneurial talent.

The business is set to expand further with a recent six-figure cash injection from a business consortium; this will allow the company to move into craft spirits, launch a faster delivery e-commerce model and create five more full-time jobs at their Edinburgh base.

Beer52 is a success story which uses design in every aspect of building and maintaining the business. It is expected that the business will continue to grow; the craft beer market is enjoying 40% growth and online alcohol sales are also in their infancy. Beer52 plan to make the most of their commercial success while remaining true to their independent and customer-focused ethos; keeping their core operations in Scotland, creating more jobs and continuing to support small craft businesses to reach a national market.
“Being part of Design in Action’s Chiasma has allowed me to appreciate that design principles, such as engaging with users and customers to continuously improve and refine their experience, are a must-have for companies that want to grow. Strategic design adds value to what we do and separates us from our competitors.”

James Brown, CEO of Beer 52

Using design to grow a business

The Design in Action hub enhanced understanding of how design methodologies can be applied to business, organisational and institutional thinking. They brought design thinking into new sectors, and proved the value of design-led innovation across business, technology and policy. Importantly, Design in Action have taken this creative thinking into sectors not usually associated with the creative economy – food, sport, rural activities, ICT and wellbeing – identified by the Scottish Government as areas with high potential growth. The hub has further contributed to policy and decision-making through consultation, including the Scottish Parliament’s Economy, Energy and Tourism Committee and the Economic Impact of the Creative Industries Inquiries, as well feeding in to consultations on Creative Scotland’s Creative Industries Policy.

Creating and developing international partnerships

The KE Hubs have had some significant international impacts. For example, Creativeworks London is participating in the new Cultural Connections Brazil initiative, supported by the Government of Brazil. This is a new initiative, funded over five years, to encourage collaboration and exchange between creative industries and universities in Brazil and a range of international partners.

In addition, drawing on their expertise from the AHRC KE hubs, Professors Jon Dovey (Director, REACT) and Andy Pratt (Co-Director, Creativeworks London) have been commissioned by the British Council to look at Creative Hub models in the UK – how they manifest, their characteristics, similarities and differences in order to share lessons with international partner organisations.

Supporting innovation

By evidencing the effect of arts and humanities research within the innovation ecosystem, the hubs have improved their universities’ own understanding of their role. For example, Queen Mary University of London (QMUL), lead partner in Creativeworks London, quickly recognised the impact arts and humanities can have on the creative economy. As a result QMUL decided to invest £100,000 of HEIF (Higher Education Innovation Fund) funding annually into a Collaboration Fund, to enable further impacts from Creativeworks London funded projects. QMUL has also invested in two new posts; one to support innovation and the implementation of its new Arts and Cultural Strategy and the other to promote the further growth of networks established by CWL over the past four years.
Strengthening the role of universities within regions and place

The hubs have been instrumental in creating a shift in the role of the university within their local ecology. For example, through the Design in Action hub, the University of Dundee has identified design as a strategic platform for development and has raised the profile of the role of design within the city. The hub directorate contributed significantly to the city’s successful bid for UNESCO City of Design status, which was awarded in December 2014, the UK’s first City of Design.

Dundee also hosted its first Design festival in 2016, entitled ‘Design Revolution: Innovative Cities and Business’. This festival was the 2016 flagship event for Dundee’s membership of the UNESCO Creative Cities Network, bringing together representatives from the UNESCO global network of cities to showcase and discuss best practice for design economies and the application of design approaches to business growth. In addition, Design in Action has been a crucial partner in the development of the V&A Design Museum, which will open on Dundee city’s waterfront in 2018, supported by £80 million funding, which includes funding from the Scottish Government and the Heritage Lottery Fund.

“Design in Action (DiA) were key partners in achieving the designation of UNESCO City of Design… DiA’s membership of the city’s Implementation Group influenced and advanced ideas for the UNESCO City of Design launch and the first Dundee Design Festival in May 2016. DiA has also been key in helping establish the Design led Business Innovation context for business in the V&A Museum of Design Dundee; working closely with partners to establish both economic and cultural value in building new thinking for future investment.”

Stewart Murdoch, Director of Leisure & Communities, Dundee City Council
BeatWoven, founded by Nadia-Anne Ricketts, is based on the discovery of a mathematical connection between the architecture of music and the architecture of woven cloth. A software programme was developed in 2009 which enabled beautiful patterns to be woven into the world’s first Fabrics of Sound.

Creativeworks London (CWL) brought Nadia-Anne together with researchers from Queen Mary University of London through its innovative creative voucher scheme to help develop BeatWoven. Further AHRC funding received by BeatWoven enabled it to develop software to support the ongoing growth of the company and increased engagement with the public.

The development of an app bought with it a major obstacle which prevented further development of the product: Nadia-Anne was unsure of where she stood legally when it came to gaining the rights to use the music, and could not access the necessary legal expertise because of its prohibitive cost.

CWL fostered collaboration between Nadia-Anne and Dr Noam Shemtov at Queen Mary University who specialises in complex intellectual property and copyright questions. This partnership had a positive impact for both parties. BeatWoven could overcome these legal obstacles and continue to grow to the next level as an organisation safe in the knowledge that its practice was not infringing any copyright laws. Dr Shemtov drew on the experience to publish a paper, where BeatWoven is a case study, which will help businesses facing similar issues in the future. The impact of this project has therefore gone well beyond BeatWoven, as Nadia-Anne states: ‘the opportunities this project will bring not only to BeatWoven but to the wider creative economy are endless.’

Since the initial collaboration BeatWoven has received commissions from the Southbank Centre, British Film Institute and London Philharmonic Orchestra. Nadia was selected by the esteemed design critic and journalist Corinne Julius to be showcased as one of “THE names in British craft” as part of her curated platform for London Design Festival 2014. She has worked with Harrods on an exclusive collection that associated her as one of their ‘Rising Stars’. She was showcased as a Future Heritage project at Decorex International 2014 and at Future Artefacts 2015 and was accepted on to the Crafts Council HOTHOUSE 5 programme in 2015.

Top: GoldenDaze is a design based on the song A Kinda Magic by Queen. Courtesy of Beatwoven.

Middle: Ella is a design based on the song I only have eyes for you by Ella Fitzgerald. Courtesy of Beatwoven.

Right: Purple Reign, is a design based on the song Purple Rain by Prince. Courtesy of Beatwoven.
The Creative Cardiff network is just one example of the desire to sustain the REACT ethos and to further develop the models it championed to meet particular regional ambitions. Established by Cardiff University’s Creative Economy team and backed by a £1.5m investment from Cardiff University, the partnership includes Cardiff University, the Wales Millennium Centre, BBC Cymru Wales and Cardiff Council. Creative Cardiff brings together people working in the local creative economy to make Cardiff the most creative place it can be. By focusing on this area of activity, Cardiff University aims to support and enable the cultural life of the city and the economic activity with which it is connected.

The first year and a half of Creative Cardiff’s work ran alongside the final 18-months of the REACT programme. This overlap provided a period of two-way reflection between REACT and Creative Cardiff that revealed the benefits of moving investment away from the centre to the periphery to better ‘go with the grain’ of local networks. In its inaugural year, Creative Cardiff kicked-off with a programme of ‘52 Things’ made with and for the city’s creative community. Encompassing an eclectic range of activities, one ‘thing’ was offered each week to inspire, inform and engage those working in Cardiff’s creative economy. Crucially, these interactions kick-started discussions and facilitated the construction of a connected series of local networks.

By connecting people from across the full breadth of Cardiff’s creative economy – from dancers and marketing professionals to architects and app developers – these networks stimulate collaboration and idea-sharing to encourage innovation and creativity within the city. Drawing on the REACT model, Creative Cardiff is currently setting up its own creative hub to provide a dedicated space in which businesses, creative organisations and freelancers can collaborate in innovative ways with academics and students. To date, over 40 individual networks have been established, ranging in scope from ‘Bitcoin Wales’ to ‘Cardiff Creative Writers’ to ‘Games Wales South’ an industry group of games developers, educational institutions, media partners and industry bodies with a shared interest in promoting the games industry in Wales.

Sara Pepper, Director of Creative Economy for Creative Cardiff, was clear on the benefits of the model derived from the AHRC funded REACT KE hub: ‘Despite the increasingly digital world in which we work and live, the power of person-to-person interactions seems now more valuable than ever. It’s face-to-face meetings that foster trust and enable us to build solid, long-term relationships and partnerships – some of the most important factors in developing and growing any business or cluster of similar or related businesses.’ It is this understanding of the benefits of face-to-face networking that underpins both the REACT and Creative Cardiff philosophies. This way of working, pioneered by REACT and championed by Creative Cardiff, is driving change within academic and institutional thinking about the benefits that arts and humanities scholarship brings to business and the wider community. As Sarah Pepper highlighted, ‘we have significant opportunities to do this more and better with our arts and humanities disciplines and it is very promising that Cardiff University is investing in this potential by supporting the Creative Economy project. Watch the Creative Cardiff space’.
The KE hubs have provided new models for how arts and humanities researchers can work with and benefit creative entrepreneurs and new businesses. They have promoted awareness of the creative economy within their Universities, highlighting the value of engagement with the sector both to produce better research and to drive economic growth. They have also significantly raised awareness of the value and benefits of working with the research base amongst creative businesses and organisations.

Over the past four years the KE Hubs have faced many challenges, such as contracting, IP, and organising new networks. The AHRC now has the opportunity to reflect upon and incorporate the lessons learned from the exercise into future funding models to support the creative economy. Several issues require further exploration:

**Supporting routes-to-market**

A significant issue for a number of the projects supported by the hubs was finding routes to market and commercialisation. Many micro-businesses and freelancers do not have the skills and resources to solve these problems by themselves, while the AHRC, in fulfilling its primary function as a funder of research, cannot support business development as such. What the AHRC can do however is to facilitate and lead collaborative approaches to investing in the creative economy with other partners who are equipped to help businesses take ideas to market and accelerate growth.

**Public engagement**

The hubs produced a significant number of non-academic KE outputs, aimed not only at researchers and practitioners but at the wider public as well. The successful REACT Festival held in November 2016

“Creative Cardiff works through many partnerships in an area recognised as crucial to the future prosperity and cultural identity of the Cardiff City Region. The AHRC’s lead investment in four creative economy knowledge exchange hubs has been pivotal to our own decisions to invest further in work which connects arts and humanities research with innovation in the creative economy.”

Professor Colin Riordan, Vice-Chancellor
Cardiff University
was visited by 6,000 members of the public over two days, introducing the role of research within the creative economy. Universities and academics need a better understanding about the nature, importance and impact of these non-academic outputs: for instance, whether serendipitous connections from these events and outputs can create stronger innovation networks.

Engaging with large businesses
Since the hubs were launched in 2012, they have mostly engaged with micro and small sized enterprises. They have not worked with as many medium or large organisations as anticipated. There are a number of possible explanations for this which AHRC will reflect upon and aim to address in developing the next phase. One issue could be timing – the hubs largely supported short-term projects, often only up to 3 months in duration. Large businesses can take time to nurture relationships that lead to collaborations, often due to governance structures or prioritisation of other activities, and their way of doing things did not align to the hub timelines.

Sustaining collaborations
A central challenge for the KE Hubs has been to create sustainable collaborations beyond the four year funding period. During their first year of operation, the hubs were focused on evolving and developing processes, building networks and recruiting staff; and in the final year their priorities were retaining staff with suitable skills and knowledge, capturing impacts and maintaining their networks. Despite successes such as Creative Cardiff to continue the legacy of REACT, feedback from the hubs suggests that longer-term funding would enable more robust infrastructures for supporting knowledge exchange in and with the creative economy that would generate more sustainable collaborations.
The creative economy is a large and expanding part of the UK economy. The UK has particular strengths as a creative nation, and there are big opportunities within a growing global creative economy to grow export markets and exercise "soft power". However the UK is vulnerable to increasing competition and must innovate and invest to maintain and strengthen this world-leading position.

The KE hubs programme has demonstrated that arts and humanities researchers play a vital role in the creative economy, collaborating with businesses to generate new ideas, bring people together and develop skills and talent. The AHRC has a fundamental leadership role to play: it can stimulate and incentivise, co-ordinate activities that happen in different places, spread learning throughout the HEI system, and invest resources where they can be most effective.

The AHRC now wishes to build upon previous investments in the creative economy to deliver at greater scale demonstrable economic, social and cultural impacts from arts and humanities research. We aim to be ever more responsive to the needs of the creative economy – supporting innovation by creating and co-ordinating research not only across the spectrum of arts and humanities disciplines, but in other research areas as well. The AHRC remains committed to promoting the research and innovation that underpins the vibrancy and success of the UK’s creative economy. A crucial next step will be to partner with other organisations and funders who share that goal, and that can help us to build stronger and more sustainable collaborations and partnerships between UK universities and the UK’s creative and cultural industries. This is something the AHRC will be pursuing vigorously in its next phase of investment in the Creative Economy.
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