



Report of the
Digital Economy NetworkPlus
Community Event
Held on 3rd July 2017

1. Background to the Meeting

This meeting was held to facilitate applications to the call for Digital Economy (DE) NetworkPlus proposals:

<https://www.epsrc.ac.uk/funding/calls/denetworkplus/>

The specific objectives of the meeting were:

- To help potential applicants to understand the scope and requirements of the call
- To facilitate discussion of potential research areas where a NetworkPlus is needed
- To help people identify and meet potential collaborators
- To share outputs with those who could not attend.

Attendees were asked to submit answers to the following questions as part of an Expression of Interest to attend:

- In which topic do you feel there should be a DE NetworkPlus?
- Please give further details on what this topic covers
- Why is this a good topic for DE NetworkPlus?

Topic suggestions were then sorted by attendees ahead of the meeting using the 'Well-Sorted' tool (<https://www.well-sorted.org/>), to inform break-out groups on the day. Annex 1 shows the results of the sorting exercise.

The attendee list is given in Annex 2.

2. Meeting Agenda

Time	Agenda item
10:30	Arrival and Coffee/Tea
11:00	Welcome
11:15	Icebreaker exercise
11:30	Digital Economy Network Plus Call - Claire Tansley
12:00	Running a NetworkPlus – Roger Maull and Sarah Sharples
12:45	Well Sorted Results – Claire Tansley
13:00	Lunch
13:45	Facilitated Session on potential NetworkPlus topics
15:00	Feedback from groups
15:30	Coffee/tea
15:45	Further facilitated session
16:15	Q&A and wrap-up
17:00	Close

3. Overview of the Digital Economy NetworkPlus Call

John Baird presented a brief introduction to the Digital Economy Theme and Claire Tansley gave an overview of the background to the call, the call requirements and the assessment process.

A NetworkPlus brings together a wide range of stakeholders to share knowledge, build a community, identify research priorities and opportunities, and kick-start collaborative research activities. This call is 'community-led' – applicants need to propose and justify the area of focus.

Proposals must be at least half in EPSRC's remit. NetworkPluses should include expertise in computer science and/or mathematical sciences and/or engineering. Topics should involve co-creation and implementation of novel, people-centred digital technology solutions which incorporate legal and ethical considerations. Applicants are advised to contact EPSRC if they are unsure about whether their proposed topic fits the remit of the call.

NetworkPluses should be highly multi-disciplinary and activities should be UK-wide. NetworkPluses should complement existing network and research activities in the area.

Further details, including lessons learned from a review of previous DE NetworkPluses, can be found in the slides which have been published alongside this report.

Attendees were given the opportunity to ask questions about the call. These have been incorporated into the 'Frequently Asked Questions' document which has also been published alongside this report.

4. Running a NetworkPlus

Roger Maull and Sarah Sharples have both been Principal Investigators on other EPSRC NetworkPlus grants and they spoke about their experiences. Their slides are also available on the call web page.

Roger Maull was the Principal Investigator (PI) on the New Economic Models in the Digital Economy (NEMODE) DE NetworkPlus which started in 2012. He is also PI on the CREDIT network, which started last year.

Roger explained that the previous four Digital Economy NetworkPluses were all consortia of different universities. There were some overlaps between the networks and they worked together.

Roger emphasised that a network is an enabler, not a research project.

In NEMODE there was a lot of discussion, particularly in the first six months, to define exactly what a New Economic Model is. Those with expertise in digital technology (development of new technology, new algorithms etc.) and those from Economy (study of the effects of the technology) came with very different perspectives.

NEMODE investigators decided on self-denying ordinance – they didn't fund themselves from the grant.

Workshops worked very well, but placements were harder to organise – it was difficult to get industry people in to academia and only a bit easier the other way around. International placements were easier. In terms of pilot projects, some of the small £3k grants worked really well.

Roger's main tips were:

- Meeting and getting to know your finance office
- Hire the best project administrator you can
- Decide on your approach to funding activities – do you want to be top-down (targeted, directive funding) or bottom-up (open calls)?
- Be active – get out and look for people to build a network
- Don't move institution partway through – there will be lots of on-going activities that are hard to re-arrange!

Sarah Sharples is Principal Investigator on the Connected Systems NetworkPlus. This focuses on the key challenges we face as digital technologies transform our industrial systems and involves the manufacturing, digital economy, design, computing, human factors and business disciplines. There is a lot of debate and discussion around 'Industry 4.0' etc. and they have deliberately chosen a neutral name.

Sarah explained that the 'Connected Everything' NetworkPlus is coming to the end of its first year. Unlike the current call for DE NetworkPlus proposals, it was set up as a 'managed' activity by EPSRC in a specific area, with slightly different funding specifications.

Sarah found the standard EPSRC guidance on networks useful in writing her proposal:

<https://www.epsrc.ac.uk/funding/applicationprocess/routes/network/networks/bestpractice/>

The NetworkPlus seeks to focus on early career researchers who will be the leaders in this fairly new area in 5-10 years' time, and connect the different disciplines. They will be seeking to increase their interactions with industry now that they are established.

There have been a number of significant developments since the funding was awarded, including the Industrial Strategy Challenge Fund, Brexit and a new government – which means they have had to provide quick responses to requests or opportunities for strategy input, with some outputs earlier than planned. There is also increased emphasis on the skills agenda. All this requires the NetworkPlus to be flexible and responsive.

Sarah's main tips were:

- Recruitment a really good Network Manager
- Think of your network as part of your wider portfolio of activities. Ask yourself why you want to be a NetworkPlus investigator (PI or Co-I). You will be leading and serving the community. The visibility may lead to other opportunities.

- Write a tight proposal. You will be able to delegate quickly to others with clear plans in place. But leave flexibility for the unexpected.
- Work out your external image to provide better engagement
- Think about the different communities you wish to engage

Q&A:

Q. Receiving only 80% Full Economic Costing on a NetworkPlus grant is difficult to sell to universities, are there any creative ways to convince universities that it is worth it?

A. The difference between NetworkPlus grants and standard research grants is the margin - with a NetworkPlus the margin is smaller so it is about how the network will contribute to the university's strategy. (The margin is essentially the difference between the money coming in versus the absolute costs out, and with a NetworkPlus there are fewer directly allocated costs so a smaller margin.)

Q. Distribution of resources – is the 'no Co-Is or PIs to bid for feasibilities' a rule or just a principle?

A: Networks are about building a community, so by doing this you encourage others to get involved, but this might not be needed in every case. There are examples of other NetworkPluses where PIs and co-Is have held feasibility funds, but they had to make the case for this.

Q. How do you manage the risk and potential non-delivery?

A: You need to consider how you assess and manage proposals. Each of the Connected Everything feasibility studies has a mentor associated with it, spend and activities are monitored but we try to do this in a helpful way i.e. helping with dissemination. Not all studies will work/pay off as this is risky research we are funding.

You should know that you will be responsible for submitting the Researchfish report for each activity that is carried out every year! Good idea to ensure you capture this information as you go along.

Q. On reflection what does success feel like? What is a successful feasibility study?

Roger: One that results in more than expected or asked for, this was true especially for those that combined both digital *and* economy.

Sarah: Most will be able to deliver scientific publications, show how technology from other areas can be applied within the DE space, scientific proposals for future funding. We also want to find out if work has led to individual career progression or incorporate outputs into physical demonstrations where we exhibit technology developments.

Q. Can you give examples of support or leverage from catapults and industry?

Sarah: We have received support from the Digital Catapult in terms of facilities. All of our feasibility studies have industrial partners which provide some sort of 'in-kind' support.

Roger: We have industrial representation on our advisory board and some cash contributions.

Q. It seems like small feasibility studies aren't great for encouraging collaborations, can you elaborate?

Roger: No, but they are useful for people to undertake small activities. The ideas for the small feasibility studies came from the workshops (which were collaborative).

Sarah: Feasibility studies of £50-60k seemed to provide enough money for collaboration, and a few are even multi-institutional collaboration. But this might not be appropriate for all areas of DE.

5. Discussion of Potential NetworkPlus topics

Attendees were invited to select a break-out group, based on the Well-Sorted colour groups (annex 1), to discuss the topics of most interest to them. Each group was invited to fill out a proforma, through discussion, to answer:

- What is the scope of this NetworkPlus topic?
- Why is a NetworkPlus needed in this area?
- What sort of activities should the NetworkPlus undertake?
- Who should this NetworkPlus involve?

Each group was then asked to come up with a title and a sentence to summarise the area.

The resulting potential NetworkPlus areas were:

Smart build of the digital environment

- Digital economy for the built environment

D-TIG Network+

- Digital transformation and inclusive governance

HACTAR (Historical and Awkward Computer Technology Analysis and Recovery)

- Supporting and Enabling Recovery, Preservation, Provenance and Analysis of Historical Data

The co-created community of a three pointed triangle – Interaction, Immersion, Innovation - data led and creative led.

- Three pointed triangle – Interaction, Immersion Innovation that are data led and creative led.

Voice Creator

- New literacies for community cohesion – enabling, empowering and expanding the way young people express their stories

OPENing BANKING and the Future of Value

- This NetworkPlus explores new representations of value resulting from disruptive technologies and emerging social economic processes

Digital Solutions/DE for National Resilience (Transport, Food, Health)

- Creating and capturing value beyond the factory

The real threat of AI (and data, ML,)

- 1. Socio cultural concerns / drivers. 2. Ethics & legal concerns & drivers, 3. HDI

Living with data/Better living through data/Human and artificial intelligence touching data

- Interaction between AI (humans/data), HCI and visualisation – and the relationship to security/privacy/business model

Digital Health Plus (DH+)

- Technology Underpinned Sustainable (Personalised) Health care System

The completed proformas are reproduced in Annex 4.

It was emphasised that these discussions and proformas were simply a tool to help potential applicants start thinking about NetworkPlus ideas; they do not form a set of themes or priorities for the call.

6. Next steps

Anyone with further queries after reading the slides and the FAQs should contact EPSRC:

claire.tansley@epsrc.ac.uk

tracy.keys@epsrc.ac.uk

The closing date for outline proposals is 29th August 2017.

Annex 1

Well Sorted Groups

<p>1: A DE NetworkPlus topic for Advanced Manufacturing</p> <p>3: Manufacturing Futures through Digital Technologies</p> <p>5: Digitalisation for products & production-sy...</p> <p>7: All-automated economy enabled by advanced robotics</p> <p>9: New business models for digitally enabled services</p> <p>11: Digital ecosystem for connected cars.</p>	<p>2: Advanced services for future manufacturing</p> <p>4: Productivity and skills in Digital manufacturing</p> <p>6: Internet of Things, Industry 4.0</p> <p>8: technology enabled use based economy.</p> <p>10: Markets Transition to Digital Energy</p>	<p>15: Lived inequalities within digital infrastructures.</p> <p>18: Delivering Government Digital Transformation</p>	<p>16: Reducing inequalities through UK digital expertise</p> <p>19: Public interaction with computation</p>	<p>17: Algorithmic Government</p> <p>20: Citizen Science</p>	<p>21: 1. Secure and Resilient DE -2. Social computing</p> <p>22: CyberInvestigations.</p>	<p>25: Web and our well being -</p> <p>26: Digital health and social care; robotics</p> <p>27: 5G and LPWA in health and care</p>	
		<p>23: The future of money, banking, currencies, finance.</p>		<p>24: I-Mobility -blockchain, machine learning, bigdata</p>			
		<p>28: Networked notations for creative communities</p> <p>29: Creative Innovation: practice-led ICT development</p>		<p>34: Human cyberphysical interaction.</p> <p>37: Human Data Interactions -</p> <p>40: From Hybrid Human-Machine Computing to New Economy</p>		<p>35: Interfaces between humans and machine learning</p> <p>38: Humans and the Internet of Things</p> <p>41: Research at the intersection of AI and HCI.</p> <p>44: Ethical and efficient systems for personal data -</p> <p>47: DE: Data Science and Augmented Intelligent Systems</p>	
		<p>30: Creative technologies (CT) and the smart city</p> <p>31: Innovation in Interactive Tech for Children -</p>		<p>43: Immersive Technology</p> <p>46: Everyday life in ambient environments</p>		<p>36: Human-Data Interaction</p> <p>39: Designing Automated Systems for a Human Future</p> <p>42: Intersection of BI, HCI, Design and AI in games</p> <p>45: Data Visualization for Human Insight</p> <p>48: Network Science.</p>	
<p>12: Digitalisation of the Built Environment.</p> <p>14: Smart contracts in construction and engineering.</p>		<p>13: Blockchain technologies for the built environment.</p>		<p>32: Digital Preservation.</p> <p>33: Virtual community design and regulation</p>			

RED

BLUE

GREEN

ORANGE

PURPLE

YELLOW

PINK

SILVER

Annex 2

Attendees

Charith	Abhayaratne	University of Sheffield
Arantza	Aldea	Oxford Brookes University
Juliet	Allen	University of Westminster
Timothy	Baines	Aston University, Birmingham
John	Baird	EPSRC
Steve	Brewer	University of Southampton
David	Brown	University of Portsmouth
Jonathan	Cave	University of Warwick
Matthew	Chalmers	University of Glasgow
Peter	Cowling	University of York
Leon	Cruickshank	Lancaster University
Sean	Damberger	University of Manchester
Miriam	Dowle	EPSRC
Anders	Drachen	University of York
Zeynep	Engin	University College London
David	Gerrard	University of Cambridge
Maurizio	Gioli	Ravensbourne
Anita	Greenhill	University of Manchester
Sarah	Halliwell	EPSRC
Tracy	Harwood	De Montfort University
Nick	Holliman	Newcastle University
Ed	Hughes	University of Sussex
Helen	Kennedy	University of Sheffield
Tracy	Keys	EPSRC
Shujun	Li	University of Surrey
Chris	Marsden	University of Sussex
Angus	Marshall	University of York
Sarah	Martindale	University of Nottingham
Jim	Mason	University of the West of England
Roger	Mauil	University of Surrey
Francesca	Medda	University College London
Jason	Morgan	EPSRC
Damian	Murphy	University of York
Madalina	Nazare	Digital Catapult
Jesus	Nieto-Martin	London Business School
Irene	Ng	University of Warwick
Patrick	Olivier	University of Newcastle
Dolly	Parkinson	EPSRC
Eujin	Pei	Brunel University London
Wasiu	Popoola	University of Edinburgh

Edmond	Prakash	University of Westminster
Elpida	Prasopoulou	Coventry University
Pathmeswaran	Raju	Birmingham City University
Janet	Read	University of Central Lancashire
Ben	Roberts	University of Sussex
Chris	Rolls	EPSRC
Hefin	Rowlands	University of South Wales
Mark	Sandler	Queen Mary, University of London
Nishanth	Sastry	King's College London
Andreas	Schroeder	Aston University
Siraj	Shaikh	Coventry University
Sarah	Sharples	University of Nottingham
Advaith	Siddharthan	Open University
Martin	Simpson	University of Liverpool
Chris	Speed	University of Edinburgh
Atau	Tanaka	Goldsmiths, University of London
Claire	Tansley	EPSRC
Philip	Treleaven	University College London
Tim	Unwin	Royal Holloway, University of London
John	Vines	Northumbria University
Carrie	Wootten	KTN
Jian-Bo	Yang	University of Manchester
Simeon	Yates	University of Liverpool
Hongnian	Yu	Bournemouth University
Syed Ali Raza	Zaidi	University of Leeds
Ali	Ziaee Bigdeli	Aston University

Annex 3

Details of topics submitted (*colours refer to groups in Well Sorted results, shown in Annex 1*)

In which topic do you feel there should be a DE NetworkPlus?	Please give further details on what this topic covers	Colour
Blockchain technologies for the built environment.	Construction & Built Environment Knowledge Transfer consortium in blockchain distributed ledger and smart contract technology to underpin the Government's investment in Building Information Modelling (BIM) technology.	Blue
Smart contracts in construction and engineering.	The construction and engineering sectors lag behind other industries in terms of the automation of their processes. This is often explained away as "we are different" this is not the whole picture and needs exploring.	Blue
Digitalisation of the Built Environment.	Technology & processes related to how multi-user/multi-organisation/multi-stakeholder digital content is created, stored and accessed both securely and resiliently.	Blue
Reducing inequalities through UK digital expertise	There is much focus on ways through which digital technologies can contribute to economic growth; much less on reducing the inequalities that this growth causes. This network would deliver solutions relevant to DFID's 2017 digital strategy.	Green
Algorithmic Government	An AI and DLT community to automate government services and support civil servants.	Green
Lived inequalities within digital infrastructures.	The CCNetwork+ worked with homeless, NEET, unemployed, extremely rural - and found that the gaps between these populations and the digitally included were growing. How is agency possible within an increasingly datalogical infrastructure for such groups?	Green
Delivering Government Digital Transformation	IT enabled transformation projects are central to policy implementation, but many go over-budget, miss deadlines, and under-deliver outcomes. New opportunities now exist to for DE-style interdisciplinary 'research in the wild' to improve their delivery.	Green
Citizen Science	Many projects let the public contribute environmental (biodiversity, plant diseases, invasive species, etc) and other information. New technologies are needed to harness citizen science's potential to reliably curate knowledge and monitor our world.	Green

Public understanding of computation	Investigating and supporting improved understanding of and engagement with computation by the general public. It involves HCI, AI, information science and human communication in ICT, and extends to education and culture.	Green
CyberInvestigations.	A multi-disciplinary approach to understanding, investigating and preventing crime in the digital economy.	Orange
1. Secure and Resilient DE - 2. Social computing	Comprehensive understanding of stakeholders in DE - - Current and emerging threats and opportunities - - Tools, techniques and approaches to achieve secure and resilient DE - - Improving the contribution and synergy of human involvement in digital systems	Orange
Digital Preservation.	Digital Preservation involves sourcing digital materials worth preserving, getting them under control and maintaining their usefulness for the long-term.	Orange
Virtual community design and regulation	Virtual communities are central to evolution of online behaviour, and evolutionary economics of co-creation. Emergent behaviour and its regulation are central to Next Generation Internet design: 5G Internet of Things cloud computing and Privacy by Design.	Pink
Creative technologies (CT) and the smart city	CT is an emergent area combining computer technology, art, design and social sciences, yet 'smart' city initiatives often ignore affordances of 'art' in urban environments. This topic explores how CTs can support development of smart cities.	Pink
Networked notations for creative communities	Networked digital notations to widen access to music across genres - Critically debating, co-developing and testing the value of networked digital music notation tools with communities (education, therapeutic, professional) -	Pink
Innovation in Interactive Technology for Children -	Simplistic and accessible interface design, security and trust, adaptive systems and robotics, persuasive and pervasive technology as well as wearables and AR/VR; the study of play, education, and gaming and of the effects of technology on children -	Pink
Creative Innovation: practice-led ICT development	This covers projects in which creative practitioners and computer scientists co-create and implement transformational digital interactive media. Novel technologies will help keep UK Creative Industries at the cutting-edge of the global market.	Pink
I-Mobility - blockchain, machine learning, bigdata	New trends: aging populations, climate change, products where we have a change consumer/producer/consumer. Mobility is entering a new era based on new smart contracts (blockchain application) and personalised consumption (machine learning/big data).	Purple

The future of money, banking, currencies, finance.	This topic could cover issues related to the impact distributed ledgers, digital identity management, cashless-ness etc. have on institutions and societies but issues around the dematerialisation of money, influence of usable AI, and financial exclusion.	Purple
A DE NetworkPlus topic for Advanced Manufacturing	The DE NetworkPlus topic for Advanced Manufacturing will cover manufacturing standards, and bring together special interest groups, manufacturing bodies, national standards bodies and the higher education sector. Contact Eujin Pei at Brunel University.	Red
Internet of Things, Industry 4.0	Matchmaking between research capabilities and industry requirements.	Red
Advanced services for future manufacturing	These high-value services embrace digital technologies and society's growing appetite for 'experinces', they build on the design, technology and engineering competences of manufacture, and deliver substantial business sustainability, resilience and growth	Red
New business models for digitally enabled services	This focuses on the development, experimentation and exploitation of novel business models to create and capture value from digitally enabled advanced services, and unlock the potential of digitalisation in the manufacturing context.	Red
Manufacturing Futures through Digital Technologies	The future of UK manufacturing depends upon firms embracing digital technologies, to become more connected and intelligent in providing advanced services, which enables companies to improve productivity, product innovation and customer performance.	Red
Technology enabled use based economy.	How outcome or use based business models are transforming service/product and process design. Often associated with capital goods (power by the hour) they have the potential to transform all sectors with implications for IoT, data analytics etc.	Red
Digitalisation for products & production-systems	Digitalisation offers the prospect of an ongoing feedback loop between the 'product-in-use' and the manufacturer. Effectively utilizing 'product-in-use' data is essential for manufacturers to continuously revise product design and production decisions.	Red
Digital ecosystem for connected cars.	The topics will cover a range from automotive platform sensing and connectivity, and how it underpins digital interactions for people and societies, retail economics, financial services and public policy around wider transport.	Red
Productivity and skills in Digital manufacturing	Identifying future skills needs in digital manufacturing, demonstrating the benefits of Industry 4.0 implementation, addressing the challenges of employment in the digital age (work 4.0), digital transformation and innovation in Industry 4.0. -	Red

All-automated economy enabled by advanced robotics	This topic covers the challenges and opportunities created by robots including automation, technical feasibility, cost benefits, labour market dynamics, economic benefits, business models, industry structures, and regulatory and social acceptance.	Red
Markets Transition to Digital Energy	Develop innovative business models for the use of data - - Enhance assets time-of-use or dynamic pricing - - Set codes and standards for smart devices - - Set interoperability standards between devices and consumers demand response	Red
Human Data Interactions -	The generation and collection of personal data has created a complex ecosystem. The multidisciplinary field of Human-Data Interaction responds to this landscape by placing the human at the centre of data flows for research across these systems and data. -	Silver
Network Science.	Network science is broad area which combines tools from statistical mechanics , graph theory, data mining and information visualization , social computing and game theory.	Silver
Human cyberphysical interaction.	We need to understand how automated, learning, autonomous and actuating computing systems and humans will interact in the future; these issues include agency, accountability, safety and privacy (both of which implicate usable cybersecurity). -	Silver
Data Visualization for Human Insight	Visualization for spatial, temporal and network data. Visualizing data quality, uncertainty and missing data. Data wrangling for visualization. High performance and cloud computing to support visualization. Automating visualization of complex data. - -	Silver
Ethical and efficient systems for personal data -	We need better links between system infrastructure, data analytics, interaction/UX design, and legal/ethical expertise. TIPS helped, but has not made a dent on hard problems such as how to combine personal and medical (e.g. NHS) data at scale.	Silver
Interfaces between humans and machine learning	The topic represents the intersection of machine learning and artificial intelligence with Interaction design and user experience. It will broach issues of data privacy and social identity. It will lead to new modes of embodied human-computer interaction.	Silver
Humans and the Internet of Things	Non-Human Ergonomics: how to design for non-humans - - New Human interactions in the IoT: - - Collaboration, cooperation and creativity between non-human actor - - Co-Design of demand-led IoT systems - - Policy, governance, Ethics and regulatory issues - -	Silver
From Hybrid Human-Machine Computing to New Economy	Blurred boundary between humans and computers => hybrid human-machine computing (HHMC) systems; new technologies / theories enabling new business models / new markets; social computing; human computation; AI; cyber security; privacy; personalisation.	Silver

Human-Data Interaction	- Ubiquitous collection and analysis of data created by and about us has created a complex ecosystem of data subjects, processors and platform providers. Human-Data Interaction is a research framework putting the human at the centre of these data flows. -	Silver
Immersive Technology	VR/AR and mixed reality technology, visualisation/audio/HCI/user experience research, measures and assessment of immersion, shared experiences, applications in industry, use of technology for creative and cultural sectors, impact for health and wellbeing.	Silver
Designing Automated Systems for a Human Future	designing socially responsible automated systems - - understanding social and cultural anxiety about automation and its implications for the deployment and management of automated systems.	Silver
DE: Data Science and Augmented Intelligent Systems	We will apply an innovative framework to allow industry to generate a significant ROI from their data and market it to an increasingly data literate public. Looking at the Future: Data will be integral to the UK's growth contributing up to £241Bn by 2020.	Silver
Everyday life in ambient environments	The topic will explore the interplay of technologies (e.g. IoT, blockchain), data infrastructures, and algorithmic activity in delivering value across different everyday contexts covering work, leisure and family life.	Silver
Research at the intersection of AI and HCI.	Understanding novel AI through large scale user trials (e.g. on commercial games). Understanding the need for tools via expertise in HCI and user co-creation - and using AI as a technique to build tools to leverage human creativity.	Silver
Intersection of BI, HCI, Design and AI in games	The EPSRC is supporting research themes along the lines of both data-driven decision making, big data, AI and HCI. Innovation and co-creation, and notably impact-driven research are core topics for EPSRS and InnovateUK for example.	Silver
5G and LPWA in health and care	5G technology, the integration of IIOT and LPWA and multi-domain orchestration on IT and App level in multi-edge cloud environments. It will add and validate relevant security strategies to protect health data networks from DDOS and ransomed attacks. -	Yellow
Digital health and social care; robotics	Digitisation of human behaviour in community healthcare; Autonomous recognition of abnormal patterns; Decision support management tools; Cyber companion adviser	Yellow
Web and our well being -	The early promise of the Social Web has now given way to concerns about the Web being an unsafe place, due to trolling, radicalisation, fake news etc. This NetworkPlus will bring together a range of experts to address these growing and related concerns -	Yellow

Annex 4

Completed proformas (*colours refer to groups in Well Sorted results, shown in Annex 1*)

Colour: Blue

Title: Smart build of the digital environment
Summary: Digital economy for the built environment
What is the scope of this NetworkPlus topic? Debugging contribution of Computational Economics in a blockchain environment through: <ul style="list-style-type: none">• Smart contracts as service enablers• Public or permissioned ledgers• Functional specification of the solution space in dynamic environments• CONSTRUCTION as a different application of the manufacturing sector
Why is a NetworkPlus needed in this area? <ul style="list-style-type: none">• Strategic area for government +£200m in BIM (construction)• 6% of GDP in construction sector £5.1B is wasted What is £1m for enabling better communication?
What sort of activities should the NetworkPlus undertake? <ul style="list-style-type: none">• Fund meetings• Prototypes characterisation• Co-ordinating construction sector sandbox• Knowledge transfer• Feasibility studies
Who should this NetworkPlus involve? <ul style="list-style-type: none">• Industry (clients, designers, contractors, suppliers, insurers)• Major tech companies• Regulators• Facility managers• Academia• Government (at different scales)
Interested co-ordinators/participants <ul style="list-style-type: none">• Philip Treleaven UCL• Martin Simpson Liverpool• Jim Mason UWE Bristol• Jesus Nieto Martin LBS

Colour: Green

Title: D-TIG Network+
Summary: Digital transformation and inclusive governance
What is the scope of this NetworkPlus topic? <ul style="list-style-type: none">• Inclusion• Governance• Understanding and developing tech behind the area (community activity)• Rethinking research methods in actual communities• Data algorithms for policy• Have the inclusion agendas of emerging tech understood
Why is a NetworkPlus needed in this area? <ul style="list-style-type: none">• Not everyone gets to play in the digital society• Value of digital economy to all social stakeholders• Giving excluded a voice• Inclusivity of participants (inc. poorest & most marginalised)• Flexibility• Functioning (dis) democracy
What sort of activities should the NetworkPlus undertake? <ul style="list-style-type: none">• Conferences• Anarchy and revolution• Online (inclusive) collaborative environments• Case studies• Framework for talking about social implications of inventions• Benchmarking/testbeds
Who should this NetworkPlus involve? <ul style="list-style-type: none">• Citizens• Private sector• Civil society• International organisations• Developers• Government• Academics as “servants”
Interested co-ordinators/participants <ul style="list-style-type: none">• Simeon Yates Liverpool• Zeynep Engin UCL• Patrick Olivier Newcastle• Steve Brewer Southampton

Colour: Orange

Title: HACTAR (Historical and Awkward Computer Technology Analysis and Recovery)
Summary: Supporting and Enabling Recovery, Preservation, Provenance and Analysis of Historical Data
What is the scope of this NetworkPlus topic? <ul style="list-style-type: none">• Domains : Cyber Investigations – Regulatory Compliance• Digital archiving – curation• Identification• Collection• Acquisition• Recovery• Reporting• Preservation• Standards• Looking for partners in date for pro-active responses• Analysis• Interpretation• Provenance
Why is a NetworkPlus needed in this area? <ul style="list-style-type: none">• Innovation and tech make this (above question) difficult• Digital Economy Based on shaky foundations• Data and information and knowledge loss• We are from related communities that don't know each other• More and more of "the truth" is digital, but digital is easier to manipulate
What sort of activities should the NetworkPlus undertake? <ul style="list-style-type: none">• Propose standards• Lobbying industry• Educating custodians• Educating content creators• Find out why people conduct specific behaviours• Networking – UK and International• Workshops• Industrial placements• Awareness raising at government / regulatory and international eg UNESCO / Interpol / Europol / Nato• Community challenge• Grants / pilots
Who should this NetworkPlus involve? <ul style="list-style-type: none">• Data creators• Scientists• Academic researchers

- Lawyers
- Ethicists
- Policy makers – research org, national, international;
- Policy makers – HE, science and research
- Computer manufacturers (software and hardware)
- Data recovery people
- e-discovery (cataloguers, info-managers etc)

Interested co-ordinators/participants

- Angus Marshall, Univ York – angus.marshall@york.ac.uk

Title: The co-created community of a three pointed triangle – Interaction, Immersion, Innovation - data led and creative led.
Summary: Three pointed triangle – Interaction, Immersion Innovation that are data led and creative led.
What is the scope of this NetworkPlus topic? <ul style="list-style-type: none">• Human-centred DE development• P2P Networking / bottom up community formation• Community design - creative led research (challenges)• Data led and creative led interaction, immersion and innovation for creative industries• Good co-creation
Why is a NetworkPlus needed in this area? <ul style="list-style-type: none">• Digital creative economics• Lots of SMEs who could benefit from focus• Research alternative to scaling• Path dependency• Pre-catapult• Strength of C.I. v uncertainty of economic outlook
What sort of activities should the NetworkPlus undertake? <ul style="list-style-type: none">• Opening and closing creative cohesion events• Placements• Makers clubs• Summer schools• Public events• Feasibility studies• Industry led indicatives
Who should this NetworkPlus involve? <ul style="list-style-type: none">• DE plus communities and cultures• Web and internet sciences• Development and design• DC labs• BBC• Start ups and equity partners• User and charity sectors
Interested co-ordinators/participants <ul style="list-style-type: none">• Irene Ng (University of Warwick)• Mark Sandler (Queen Mary, University of London)• Anita Greenhill (University of Manchester)• Sarah Martindale (University of Nottingham)• Chris Marsden (University of Sussex)

- Nick Lambert
- Maurizio Gioli (Ravensbourne University)
- Charith Abhayartne (University of Sheffield)
- Hongnian Yu (Bournemouth University)

Title: Voice Creator
Summary: New literacies for community cohesion – enabling, empowering and expanding the way young people express their stories
What is the scope of this NetworkPlus topic? <ul style="list-style-type: none">• Multiple literacies and their enablement through technology<ul style="list-style-type: none">○ For disabled○ For disadvantaged○ For communities○ For everyone• Aim: Cohesion; tech to capture, transmit, render and share (stories)• Empower, express
Why is a NetworkPlus needed in this area? <ul style="list-style-type: none">• Love and peace, plus rendering improvisation – oral, written• Digital literacy• Wearable tech• Recognition technologies/instruments<ul style="list-style-type: none">○ Arduino○ Raspberry Pi○ BBCbit○ (i.e maker tech)• Schools money, social media, arts – capturing and understanding – stories• BCI• 3D printers• Not just words – drama, music• Listening technology• Translation tech
What sort of activities should the NetworkPlus undertake? <ul style="list-style-type: none">• All the usual stuff leads to innovative tech (that is used in points below) AND <ul style="list-style-type: none">• Participatory design events• Maker competition• Storybooks (where book = a metaphor)• Performances
Who should this NetworkPlus involve? <ul style="list-style-type: none">• Designers• Programmers• Makers• Musicians• Artists• Engineers• Drama

- Media, arts – companies (BBC, FACT Lab)
- Psychologists
- Sociologists
- Computer scientists
- Journalism folk
- Give voice - mainly to children, teenagers, young adults (and also adults)
- Arts Council
- Children, teenagers and young adults
- All adults

Interested co-ordinators/participants

- Ed Hughes (University of Sussex)
- Janet Read (University of Central Manchester)

Colour: Purple

Title: OPENing BANKING and the Future of Value
Summary: This NetworkPlus explores new representations of value resulting from disruptive technologies and emerging social economic processes
What is the scope of this NetworkPlus topic? <ul style="list-style-type: none">• Blockchains DLTs• Open banking PSD2• Crowd-funding:- P2P funding• Data-driven insurance fraud detection• Distributed autonomous organisations• Transparency, trust, accountability, provenance• Social licensed currencies• Grey economies. White-Grey-Black• What is the social value of banks• Smart contracts• Ethereum• Financial data analytics and decision making• Every “thing” having a wallet• Alternative currencies• Smart insurance claim systems• Credit mutuals in the digital economy
Why is a NetworkPlus needed in this area? <ul style="list-style-type: none">• New governance models• Join banking, policy and civics• Alternate modes of value in communities• Money/date marriage• Financial transactions between “things”• Anticipating ecologies of currencies• Perfect storm is coming• New, very risky, business models• Money and value as a design material• We require ethical frameworks for new money• User-led perspective on PSD2• Post PSD2 will change how money is represented• Looking to the global south for innovation in finance• New laws are coming
What sort of activities should the NetworkPlus undertake? <ul style="list-style-type: none">• What does prototyping look like? - Sharing datasets - Sandboxes• Knowledge exchange/transfer• Youth engagement

- Community colliders!
- Brokerage
- International perspectives
- Global challenges

Who should this NetworkPlus involve?

- Credit, Nemode, Code
- Legal/lawyers
- Psychology
- GSMA
- Catapults
- FCA, NEF, BoE, Banks... Social Platforms
- Crowd-funding platforms, identity management
- Sociologists/Historians
- Economics/Business/Finance
- Design informatics, Data Science
- Modelling and decision support
- HCI
- Participatory design
- Computer science/security
- CDT in financial computing

Interested co-ordinators/participants

- John Vines Northumbria
- Jian-Bo Yang Manchester
- Chris Speed Edinburgh
- Francesca Medda UCL

Colour: Red

Title: Digital Solutions/DE for National Resilience (Transport, Food, Health)
Summary: Creating and capturing value beyond the factory
What is the scope of this NetworkPlus topic? <ul style="list-style-type: none">• Digital enabled; digital economy• Business models• Visualisation analytics• Automation• Sectors: Transport, food, health• MFG and Services (High Value)• Industry standards and good practices• NOT Industry 4.0 or IIoT
Why is a NetworkPlus needed in this area? <ul style="list-style-type: none">• Post Brexit, tariffs, labour, productivity• Supporting policy• Future sustainability of UK PLC• Support Industry strategy• “Not a low wage economy”• Need to get “value” out of DE
What sort of activities should the NetworkPlus undertake? <ul style="list-style-type: none">• Visioning the opportunity• Demonstrator (wow that could be me...)• Sit down and run it through with them...• Interpret the data and making money from it• Not just events/workshops• Gamification
Who should this NetworkPlus involve? <ul style="list-style-type: none">• User: customer, home, industry• Analytics• SME• Creative Design• Business – practitioners, researchers
Interested co-ordinators/participants <ul style="list-style-type: none">• Tim Baines• Eujin Pei• Hongnian Yu• Pathmeswaran Raju (path.raju@bcu.ac.uk)• Hefin Rowland (hefin.rowlands@southwales.ac.uk)• Charith Abliayarothe (Uni of Sheffield)

Title: The real threat of AI (and data, ML,)
Summary: 1. Socio cultural concerns / drivers. 2. Ethics & legal concerns & drivers, 3. HDI
What is the scope of this NetworkPlus topic? <ul style="list-style-type: none">• Ethics of personal data law and policy• Network science• Human data interaction – tech media, visualisation, IoT, data data data, AI as medium, adversarial AI• Bias in data/ML• Gradual erosion/change in privacy, practices, commerce, social fabric• Commerce: “FANG” companies• Economics and the future of work• Social science• Cultural history, history of tech• How opinions / markets / wishes are shaped by creative / tech media – SF as tech imaginary• Creativity influences design and tech• Automation anxiety and fear
Why is the NetworkPlus needed in this area? <ul style="list-style-type: none">• TIPS does/did not go far enough or broad enough. It’s not just about privacy, trust, security• Broader interdisciplinarity, less siloed approaches• Bigger socioeconomic scale• Harder problems, e.g. personal & corporate institutional data/personal, NHS & Apple’s data
What sort of activities should the NetworkPlus undertake? <ul style="list-style-type: none">• Community engagement workshop• Multi-disciplinary design• Feasibility studies• Workshops• Adversarial & contrarian design studies / proposals• Reports & surveys of data in/on society• Ethical / legal reviews• Link to TIPS
Who should this NetworkPlus involve? <ul style="list-style-type: none">• See box above• Link to TIPS activities
Interested co-ordinators/participants <ul style="list-style-type: none">• Matthew Chalmers (University of Glasgow)• Syed Ali Raza Zaidi (University of Leeds)• Ben Roberts (University of Sussex)• Maurizio Gioli (Ravensbourne)• Nick Lambert

Title:

Three possible titles:

1. Living with data
2. Better living through data
3. Human and artificial intelligence touching data

Summary:

Interaction between AI (humans/data), HCI and visualisation – and the relationship to security/privacy/business model

What is the scope of this NetworkPlus topic?

- Machine learning, human learning
- Exploring data
- Understand how humans engage with data infrastructures (skills, tools, classification)
- Learning from data
- Agency requires feelings / understanding
- Human data interactions: Tools, processes, agency, control, systems, literacy, skills, creativity. Humans interacting with datafication
- Data visualisation
- Understanding how machines make decisions (about humans and data)?
- Functions: solve, seek, express, create.
- Explaining decision
- Engineering of data visualisation
- Interactions between humans, info data and machine each with:
 - Individual
 - Network
 - Group/System

Why is a NetworkPlus needed in this area?

- Society is increasingly data driven. Need to humanise it
- Engage creators of ML algorithms (they are not here)
- Democratisation of data – enabling people to manipulate data
- Datafication – endogeneity, relation to the world, signal / noise (semantics)
- Interdisciplinary field – computer science, HCI, social science, economics – need to bring these communities together
- Need to provide users agency over their data
- People need help to understand data and its impact on their decisions
- Understand how people use data in their everyday life; practice
- Fallacy of
 - Design (incomplete adaptive systems)
 - Monotonicity (more data, faster proc, scale)
- Understanding datafication needs interdisciplinary community to evolve
- People from different related disciplines need to talk more with each other. Researchers and practitioners
- Data and analytics

What sort of activities should the NetworkPlus undertake?

- Create disciplinary bridges across data science and social science
- Provoking study of specific data sets (tools, understanding ML, ethics). Jamming!
- Experiments
- Create interfaces to data
- Workshops
- Citizen summits
- Sand boxes (living labs, natural experiments) ethical experiments
- Feasibility projects looking at interfaces between AI/HCI and social sciences (psychology, behaviour science, sociology. Etc.)
- Study data flows -> communication, human contact, linkage any systems

Who should this NetworkPlus involve?

- eSports – consumers, players, companies, lots of data!
- Gamer industry
- Big business and SME business
- Citizens, industry, employees, government
- Digital & future cities catapult
- Game theories, regulators, complexity scientists
- Social scientists (should they lead if we are interested in furthering the social understanding and social implications?)
- Computer scientists and related fields(creators of datafied systems)
- Designers
- Communities with identified needs- i.e. citizens
- Public / third sector / charities

Interested co-ordinators/participants

- Shujun Li (University of Surrey)

Colour: Yellow

Title: Digital Health Plus (DH+)
Summary: Technology Underpinned Sustainable (Personalised) Health care System
What is the scope of this NetworkPlus topic? <ul style="list-style-type: none">• Sustainable Health care system (Independent living etc)• Personalised healthcare• Leveraging emerging / future tech to support sustainable healthcare
Why is a NetworkPlus needed in this area? <ul style="list-style-type: none">• Need to leverage emerging and fast evolving technology to deliver sustainable healthcare• More accessible health care solutions• Data driven, internet-based, AI facilitated healthcare (big data management)• Need to combine expertise in various fields to address the challenges of the ageing society
What sort of activities should the NetworkPlus undertake? <ul style="list-style-type: none">• Workshop / conferences / PGR training• Feasibility studies• Pilots – trials• Cross-sector movement (placement)• Global engagement
Who should this NetworkPlus involve? <ul style="list-style-type: none">• Healthcare Professional (NHS, Hospitals...)• Medical Devices Manufacturers• Media• STEM – Science and Technology professional (University)• Disciplines : Engineering, Legal, Medical sciences, Computer Science, Sociology / Anthropology / Psychology, Business School, Computer Vision, Cyber Security• Pharmacy• Patients (People...)• Banks (Financial Institutions)• Councils – Governmental bodies
Interested co-ordinators/participants <ul style="list-style-type: none">• Jian-Bo Yang• Hongnian Yu• Wasiu Popoola (Edinburgh University)• Arantza Aldea