2nd NEMODE Community Meeting

1-2 July 2013
NEMODE Research Landscape
Release 001

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Introduction

The 2nd NEMODE Community Meeting took place on the 1st and 2nd of July 2013 at the London School of Economics with keynote speakers from Gartner and IBM with updates from academics funded under New Economic Models initiatives.

NEMODE is a network project funded under the Research Councils UK (RCUK)'s Digital Economy (DE) research programme. The objective is to develop a community of academics and practitioners seeking to research the potential for new economic models emerging from digital technologies. The project, which began in April 2012, has funding of £1.5 million over the next three years.

The project aims to inform policy on issues pertaining to the digital economy and engage with SMEs to stimulate new ideas and the creation of new markets. NEMODE will also inform business sectors and large companies about the changes necessary to enable them to take advantage of the opportunities created by digital technologies.

In preparation for the Community Meeting, delegates were asked to give some thought to the question, "What are the 3 most significant themes that NEMODE research should address?" Before the meeting, all attending delegates were invited to take part in a remote, online study where they arranged the themes submitted by their peers into groups. This grouping information, combined with some simple ICT techniques, allowed the planned breakout sessions to be structured and community led. The process was designed to be transparent, open, democratic, remote where possible and also maximise use of delegate time

On day one delegates heard updates on the progress of projects NEMODE has funded to date and saw presentations from sister projects funded by NEMinDE.

Day two was dedicated to proposing potential research in the NEMODE area (the NEMODE research landscape) and determining associated research questions, using the themes and thematic groups developed by the community in the crowdsourcing performed beforehand.

The following pages describe both the resulting NEMODE research landscape and the process by which it was developed by the community.

For further information contact Prof Mike Chantler on m.j.chantler(at)hw.ac.uk or Prof Roger Maull on R.S.Maull(at)exeter.ac.uk.

Top-level NEMODE Research Landscape
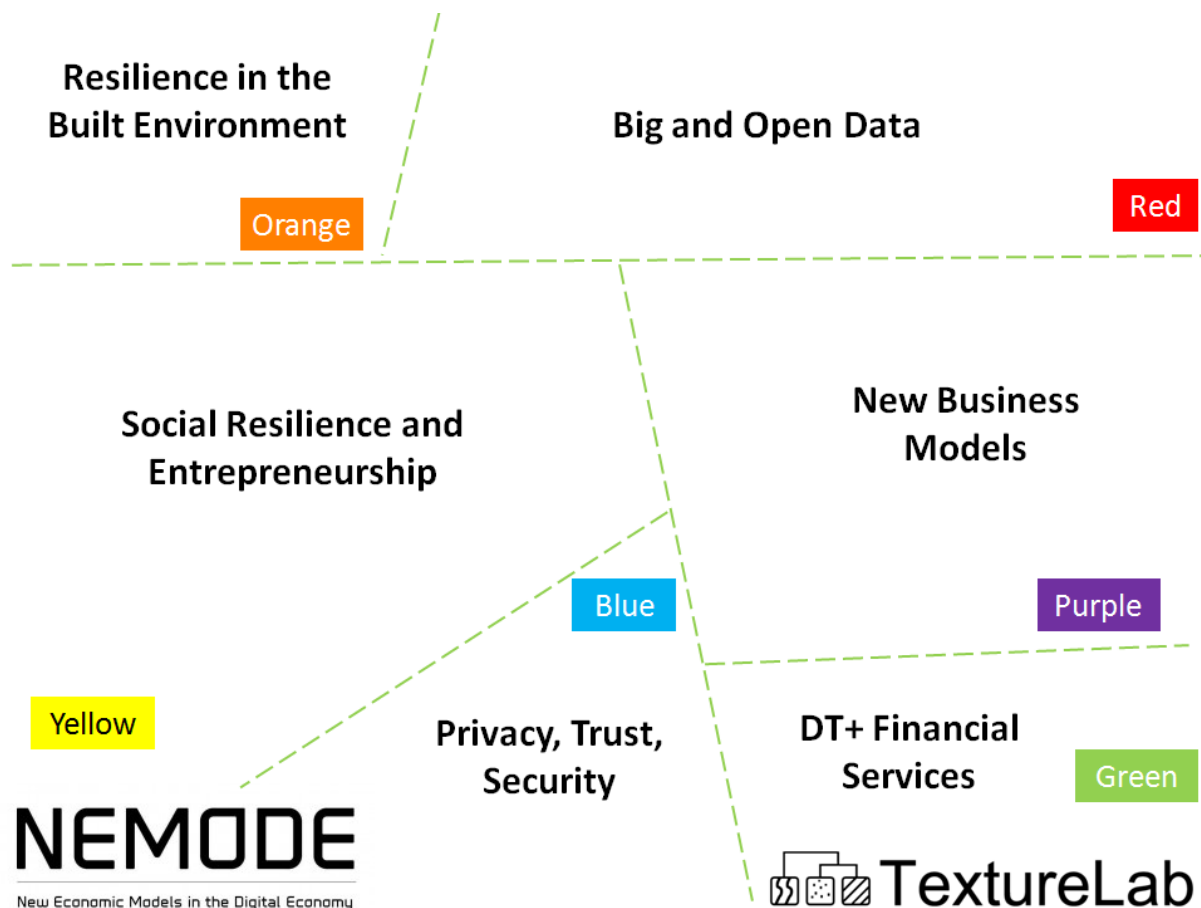
This top level diagram gives an overview of possible NEMODE research areas, but it was in fact developed from the detailed landscape (shown overleaf) generated entirely by crowdsourcing the community.

Detailed NEMODE Research Landscape

This level was created by the community using simple crowdsourcing techniques.
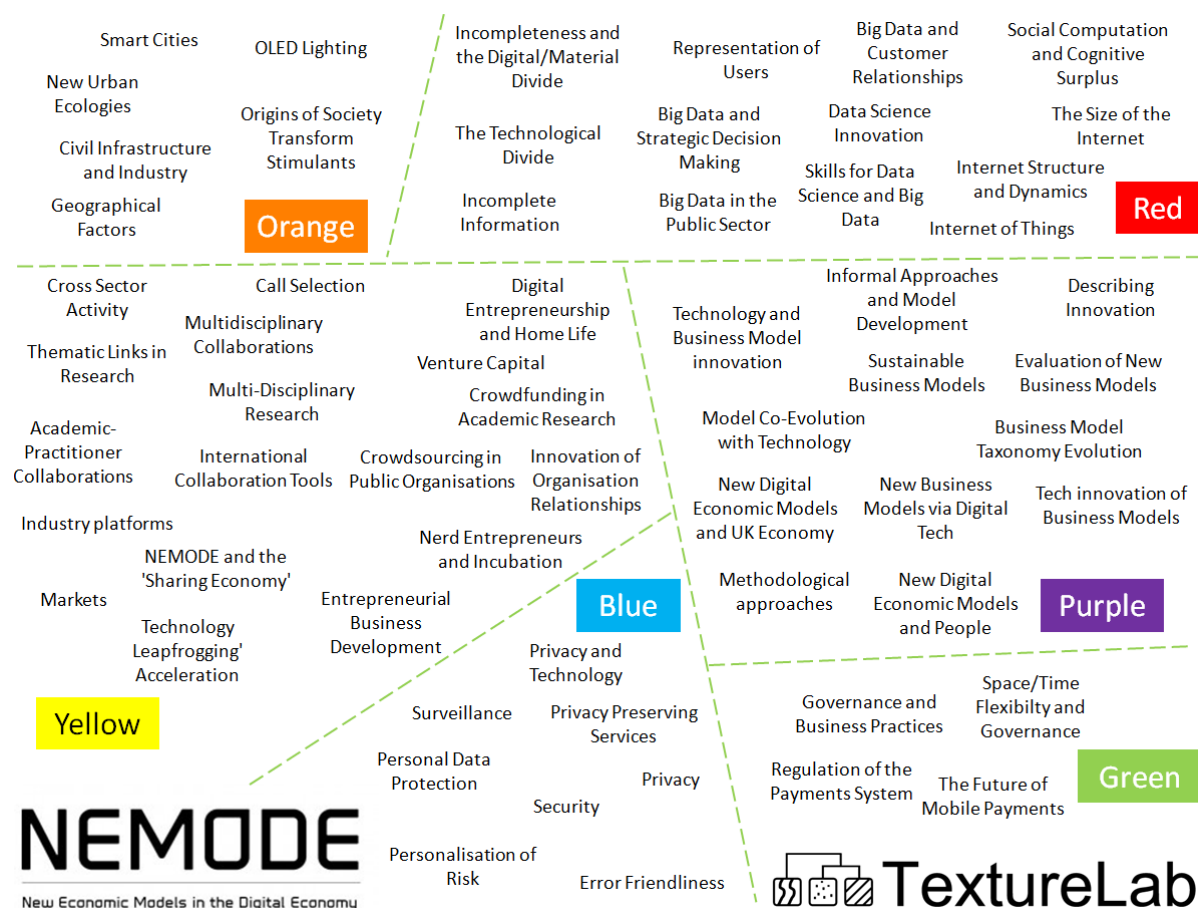
On the second day delegates chose one of the above groups to join and develop research questions. The output from the groups is shown on the following pages.

Resilience in the Built Environment

Orange

Smart Cities

OLED Lighting

New Urban
Ecologies

Origins of Society
Transform
Stimulants

Civil Infrastructure
and Industry

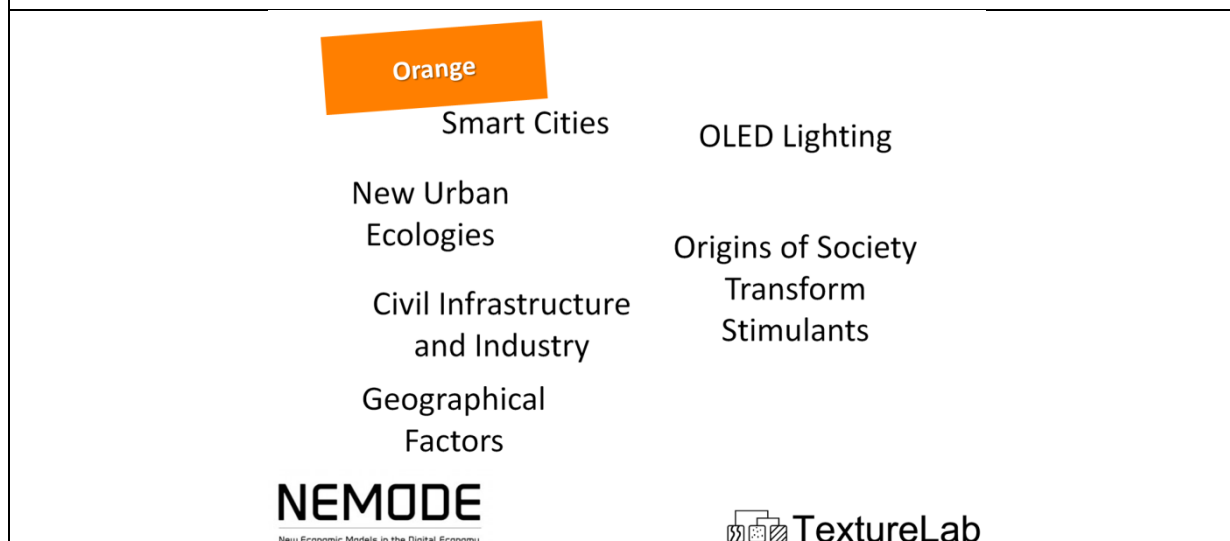Geographical
Factors

NEMODE
New Economic Models in the Digital Economy

TextureLab

Raconteur Name: Yonca Ersen
Raconteur Email: ye_class(at)hotmail.com

Group Members:
Yonca Ersen
Catherine Mulligan

Research Question #1:
The role of digital economy in building security -at every level- encompassing environmental-social-economic systems. How to design socio-technical systems for integrated social and economic activity using multiple feedback mechanisms? Taking into account possible human errors through development of mechanisms where no error becomes catastrophic.
Research Question #2:
Investigating the role of digital economy in building new supply chains with a thinking that expands beyond demand, availability and affordability? Balancing the agendas of energy, ecology, environment and moral purchasing as well as socio-economic implications.2
Research Question #3:
Connecting the dots between cash strapped cities and the innovation they need to implement sustainability both economic and environmental.

Big and Open Data
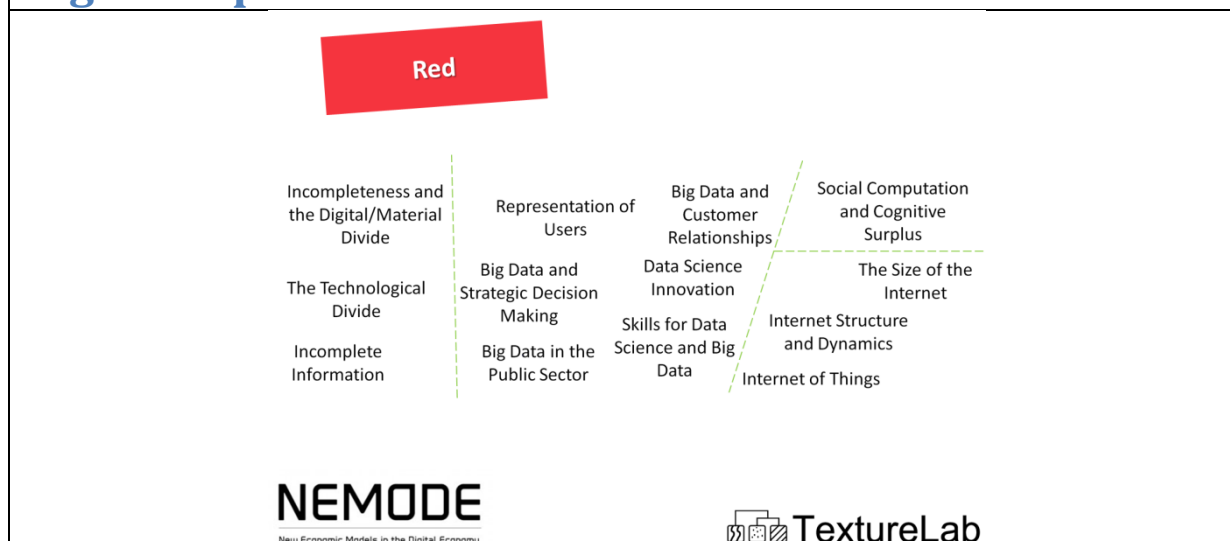
Raconteur Name: Richard Vidgen
Raconteur Email: r.vidgen(at)hull.ac.uk

Group Members:	
Richard Vidgen	Nina Marshall
Hasan Bakhshi	Carla Bonina
Maureen Meadows	

Research Question #1:
What is the value to the UK of open data? • Value and benefits in terms of economic, social, political and environmental dimensions • Issues, tensions, and challenges for the nation, organisations and citizens
Research Question #2:
What skills and capabilities do UK organisations need to create value from 'big data'? • Value of impact on: UK organisations and their business models; creation of new and skilled jobs (e.g., data scientist); and the competitiveness of the UK economy • Scope includes all stages of big data management, e.g., data collection, data analysis, using big data for business operations, using big data in strategic decision-making.. • Implications for training, education, and policy
Research Question #3:
What are the opportunities and ethical challenges for randomised controlled experiments (RCTs) around 'big data'? • We predict that public and private sector organisations will make greater use of big data to run RCTs to test business and public sector offerings • Although RCTs are a powerful way of getting evidence about what works they also raise ethical concerns: firstly, about the conduct of the RCT itself, and secondly, about how RCT data is used to guide business and policy decisions

New Business Models – Group 1
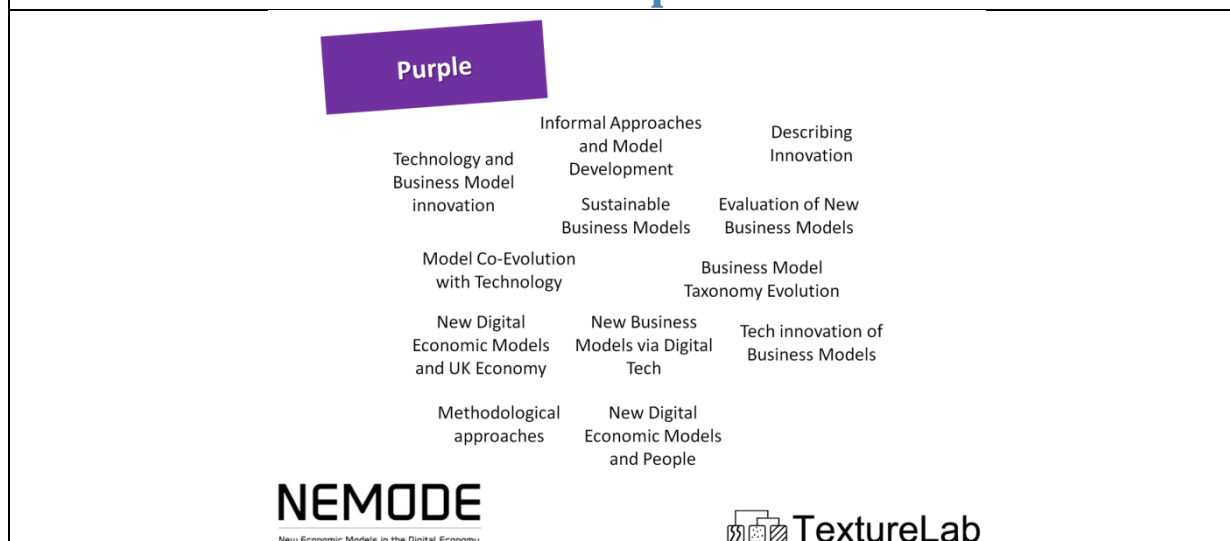
| Raconteur Name: Luciano Batista |
| Raconteur Email: l.batista(a)uea.ac.uk |

Group Members:	
Luciano Batista	Don Mcintyre
Letizia Mortara	Phil Godsiff
Angel Salazar	

Research Question #1:

How can we create a living taxonomy that evolves as a dynamic tool to help shaping new business models?

(Taxonomy)

Research Question #2:

How can we evaluate (in quantitative and qualitative terms) the sustainability of a new business model?
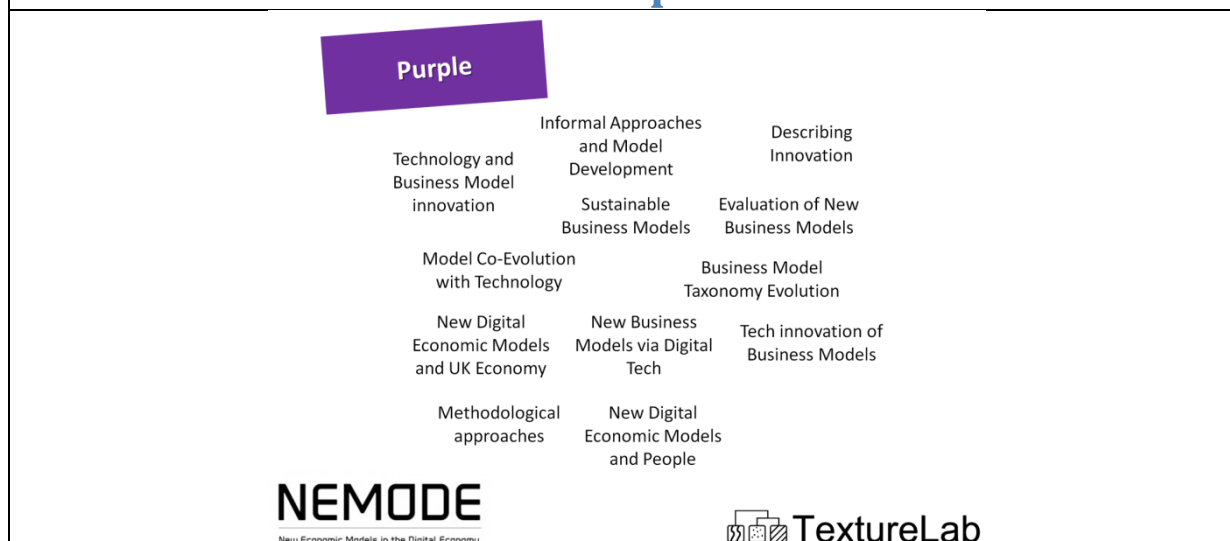
(Sustainability)

Research Question #3:

How can we define corporate governance (and required skills and capabilities) that facilitates and supports the developing digital economy?

(People)

New Business Models – Group 2

Raconteur Name: Benjamin Reid
Raconteur Email: breid(a)theworkfoundation.com

Group Members:		
Benjamin Reid	Patrick Stacey	Andi Smart
Lorraine Warren	David Wong	David Reynolds
Patrik Kärrberg	Arthi Manohar	

Research Question #1:
Institutions: How are institutions and institutionalisation enabling or constraining business models
a.   Standards? Political / economic…
Research Question #2:
Growth: Business models for growth in the digital economy. How do we amplify business models to generate and consolidate growth, and is it possible to do so – for the UK?
a.   Convert into growth – jobs, more companies.
b.   Competitiveness and open source?
c.   Beyond SME -> to large business. Business models over the valley of death.
Research Question #3:
Forms of open collaboration – might be taxonomy?: What kinds of collaborations between which players drive what kind of business models?
a.   In open innovation collaborations…
b.   What are the dimensions of ecogenesis (© Andy Smart) in digitally driven business models?
c.   Adaptation – pearson … gone to dealing with the information.
Research Question #4:
Design and research methods: what are the research methods to develop new business models for creative & digital industries which are cross-cultural.
a.   Including evaluating old models in a new context.

DT+ Financial Services

| Raconteur Name: Harry Maddern |
| Raconteur Email: h.maddern(at)exeter.ac.uk |

| Group Members: |
| Harry Maddern   Jonathan Liebenau |
| Nigel Leacock   Kathryn Waite |

| **Research Question #1:** |
| What are the economic and business impacts of digital technologies as applies to mobile payments? Impact

The effective exploitation by UK PLC of the new oil well – Analytics driven revenue streams – e.g. LevelUp. |
| **Research Question #2:** |
| How does DT impact customer empowerment in their financial services – effective decision making in pensions, for example.
Improve consumer decisioning
Reduce state burden
Business opportunity |
| **Research Question #3:** |
| What is the impact of F/S tech companies? (e.g. Structuring your finances and growing them across banks)
i.e. boundary, interface, changing on FS?

Growth/New Markets |

Privacy, Trust, Security
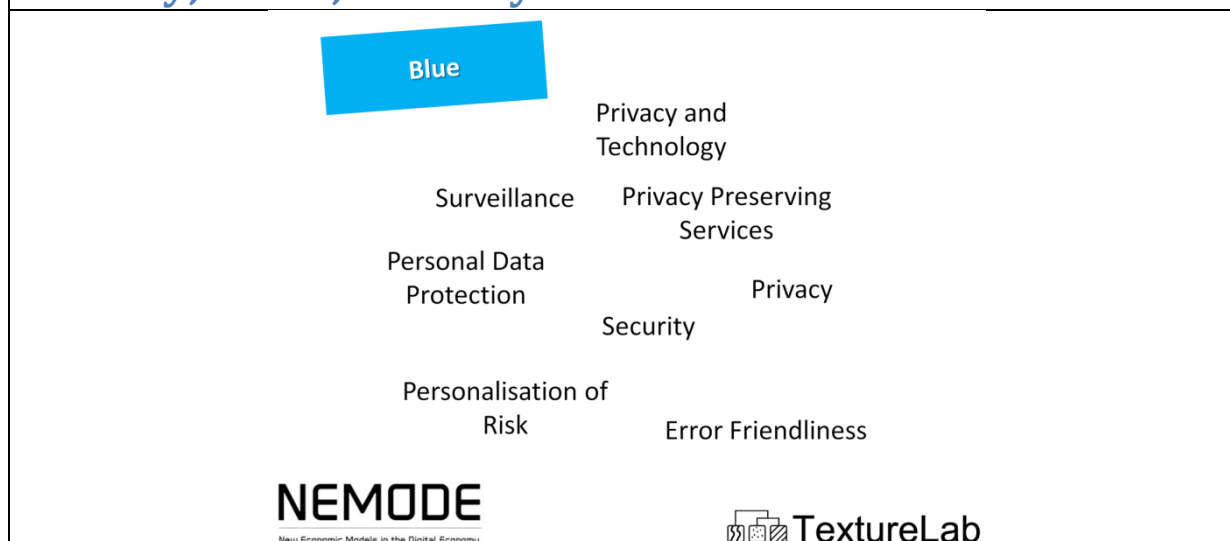
Raconteur Name: Gerard Briscoe
Raconteur Email: g.briscoe(at)qmul.ac.uk

Group Members:
Gerard Briscoe
Sunila Lobo
Silvia Elaluf-Calderwood

Research Question #1:
What should be the regulatory practices for making the distinction in working practices for data, metadata, and privacy? • Societal effect: Trust, awareness, social practice • Business Practices: When, what, who and where data and metadata are stored and mined • Design/Innovation: Designing for privacy
Research Question #2:
Privacy and big data 1. How can we preserve/protect user's privacy while sharing information to understand energy consumption patterns/demand to for energy sustainability? 2. How can we mine and exploit the digital data generated to better manage and make informed decisions and operate assets over the lifecycle? (design and construction process)
Research Question #3:
As cloud-centric computing continues to grow, how do create privacy preserving Clouds? • What is the PGP of clouds, homomorphic encryption [TECHNICAL CHALLENGE] • Potential for the individual as resource integrator [ECONOMIC] • Business models and cultural changes • Misuse of information for sale, carbon footprint of data centers, privacy vs convenience [SOCIAL]

Social Resilience and Entrepreneurship
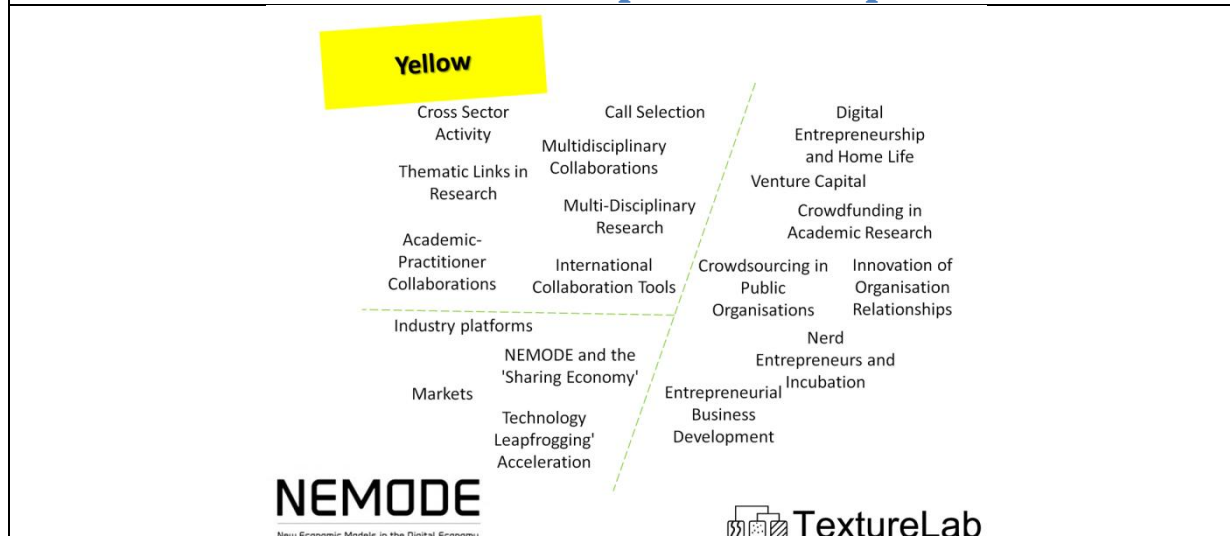
Raconteur Name: Roger Cliffe
Raconteur Email: roger(at)rogercliffe.com

Group Members:		
Roger Cliffe	Navonil Mustafee	Jaywant Singh
Vili Lehdonvirta	David Lopez-Berzosa	Joe Cox
Yonca Ersen	Elizabeth Daniel	Anita Greenhill
Rhian Silvestro		

Research Question #1:

How do we use ICTs to build social resilience?

How can we improve the digital community's ability to grow and overcome risks of for example exclusions of the elderly/poor? As new economies develop there is an increasing risk of exclusion becoming worse.

Research Question #2:

How can we use ICTs to support a portfolio economy?

The nature of work is changing dramatically with individuals increasingly engaging in temporary, part time or transitory jobs both in the paid and voluntary sectors. How can we facilitate the formation of a 2-sided individual or home centred economy to provide new opportunities for entrepreneurship, micro entrepreneurship and portfolio careers? ICTs could also be used to generate business and employment opportunities in addition to reducing the social challenges that may result from a portfolio economy such as lack of social ties and support provided by colleagues and organisations.

Research Question #3:

How can ICTs bridge international economic divisions?

Could new ICT-fuelled economic models that have emerged in the digital economy be used across countries to "leap frog" into new business/economies?

E.g. Vodafone's M-Pesa in Kenya.

Appendix A - Crowdsourced Terms

Below are all of the (full) research topics crowdsourced from the NEMODE community prior to the meeting. The short labels were provided by the NEMODE Investigators to aid manipulation in the grouping interface.

Short Label	Full Research Topic
OLED Lighting	OLED Lighting
OLED Lighting	OLED Lighting
Origins of Society Transform Stimulants	Where do the stimulants come from to help a society transform
Geographical Factors	What factors accentuate differences geographically or that serve particular communities?
Civil Infrastructure and Industry	The role of (civil) infrastructure in creating a digital economy and how the industry can collaborate to provide insight into the future of a digital economy.
Smart Cities	Smart cities – an emerging economy
New Urban Ecologies	New urban ecologies: how to design resilient socio-technical systems, new supply chain models in an eco-industrial economy?
Methodological approaches	If business model development is systemic, what methodological approaches are suited to the digital economy ecosystem
New Digital Economic Models and People	The people management / development and skill implications of the rise and spread of innovative new digital economic models-
New Digital Economic Models and UK Economy	The implications of innovative new digital business models on the UK economic - particularly its distributive effects on the UK labour market, and the implications of that for the nature of work in the UK
New Business Models via Digital Tech	Typologies of new business models enabled by digital technologies-
Model Co-Evolution with Technology	What, when and how do business models co-evolve with technology
Tech innovation of Business Models	Business Model Innovation process and how technology innovation can be the catalyst
Technology and Business Model innovation	Digital technology and business model innovation
Sustainable Business Models	Sustainable business models
Business Model Taxonomy Evolution	After more than a decade since the publication of Amit & Zott's (2001) seminal paper on value creation in e-business, has the taxonomy of business model themes (i.e., sources of value creation) in the digital economy evolved?
Evaluation of New Business Models	How do digital entrepreneurs develop and evaluate new business models and ideas?
Informal Approaches and Model Development	The incubation/tech transfer literature tends to focus on a linear trajectory based on traditional product development cycles. Less is known about business model development that specifically relates to the Digital Economy where barriers to innovation are lower and end-user involvement is more likely: how do informal processes contribute to, and amplify, business model development?

Describing Innovation	How can the process of business model innovation in digital industries be described?
Call Selection	Explain the process of selection for calls
Cross Sector Activity	What analytical frames can be used to explore the impact of digital technology on cross sector activity (ecosystems)?
International Collaboration Tools	Understanding tools for enabling international collaboration
Academic-Practitioner Collaborations	The development of new and innovative digital economic models that enhance academic-practitioner collaborations
Thematic Links in Research	Themes and areas that link to previous research work with new research work
Multidisciplinary Collaborations	Establishment of inter academic with multidisciplinary edge collaborations
Multi-Disciplinary Research	What are the barriers to and enablers of multi-disciplinary research?
NEMODE and the 'Sharing Economy'	NEMODE in the context of the 'Sharing Economy'
Technology Leapfrogging' Acceleration	One research question I have in mind is how can 'technology leapfrogging' be accelerated and how can DE contribute towards this?
Industry platforms	Industry platforms in emergent technology areas
Markets	Markets
Crowdsourcing in Public Organisations	In the light of significant funding cuts, what are the potential applications for the use of online crowdsourcing projects within public organisations?
Crowdfunding in Academic Research	What is the potential for the use of crowdfunding in the area of academic research?
Digital Entrepreneurship and Home Life	Is home based digital entrepreneurship associated with improved quality in working and home life?
Venture Capital	The procedures and investment readiness for Venture Capital and how this effects business development
Nerd Entrepreneurs and Incubation	Nerd entrepreneurs and incubation of tech firms.
Entrepreneurial Business Development	How do digital entrepreneurs develop and grow their businesses?
Innovation of Organisation Relationships	Innovation of organisation relationships
Internet of Things	The Internet of Things
The Size of the Internet	How big is the internet? What metrics are appropriate and how can we reconcile publicly available indicators such as traffic through internet exchanges with commercial trends such as traffic contained in content delivery networks [CDNs] and other private and commercial networks?
Internet Structure and Dynamics	What is the structure and dynamics of the internet and how does it change?
Social Computation and Cognitive Surplus	How can we use social computation to access cognitive surplus, third actor and informal actors to enable co-production of a range of services (e.g. Health and Care)?
The Technological Divide	I would like to see the NEMODE agenda contribute towards bridging

|	
	the widening technological divide between the least developed counties (LDC), the emerging economies and the technologically advanced countries.
Incompleteness and the Digital/Material Divide	How does incompleteness span the digital/material divide?
Incomplete Information	In a material world of incomplete or malleable artefacts and services is there a corresponding world of incomplete information and how does this provide a platform for design, experiment and production of such goods and services?
Representation of Users	Representation of Users
Data Science Innovation	Data science, innovation and business productivity
Skills for Data Science and Big Data	Skills for data science and big data
Big Data and Customer Relationships	How can 'big data' be used to support effective customer relationship management, for example in the financial services sector in the UK?
Big Data in the Public Sector	How can 'big data' support effective and efficient commissioning of services in the public sector in the UK?
Big Data and Strategic Decision Making	How can 'big data' support strategic decision making, for instance at board level in organisations?
Error Friendliness	Error friendliness: how to approach resource management for environmental, social, economic security?
Personalisation of Risk	How will new technologies enable the personalisation of risk
Security	Security
Surveillance	Surveillance
Privacy and Technology	Privacy and technology - resolving the issues
Personal Data Protection	Personal data protection
Privacy Preserving Services	Privacy preserving services
Privacy and Technology	Privacy and technology - resolving the issues
Privacy	Privacy
Governance and Business Practices	What is the relationship between governance mechanisms (regulation, ownership, legislative practices, etc.) and business practices in the digital economy (business models, commercial responsibilities, relationship with customers)?
Space/Time Flexibilty and Governance	The digital world offers us much more flexible notions of space and time - how does this impact on governance? In particular, how does it impact on the governance of commons, public goods, etc and what impact does this have on polycentric governance approaches that embody strong temporal and spatial locality?
Regulation of the Payments System	What will be the effect on regulation of new entrants to the payments system
The Future of Mobile Payments	What is the future of mobile payments services?

Appendix B – Similarity Data

Each delegate was asked to sort the terms shown in Appendix A into groups using a web application. All of these groupings' data were then used to produce the similarity matrix shown below. Clustering was performed on this matrix in order 6 groups (Orange, Red, Purple, Green, Blue, and Yellow).

This table shows the % of times each item was placed with every other item

The similarity matrix lists the following items along both rows and columns:

- OLED Lighting
- OLED Lighting
- Origins of Society Transform Stimulants
- Geographical Factors
- Civil Infrastructure and Industry
- Smart Cities
- New Urban Ecologies
- Methodological approaches
- New Digital Economic Models and People
- New Digital Economic Models and UK Economy
- New Business Models via Digital Tech
- Model Co-Evolution with Technology
- Tech innovation of Business Models
- Technology and Business Model innovation
- Sustainable Business Models
- Business Model Taxonomy Evolution
- Evaluation of New Business Models
- Informal Approaches and Model Development
- Describing Innovation
- Call Selection
- Cross Sector Activity
- International Collaboration Tools
- Academic-Practitioner Collaborations
- Thematic Links in Research
- Multidisciplinary Collaborations
- Multi-Disciplinary Research
- NEMODE and the 'Sharing Economy'
- Technology Leapfrogging 'Acceleration'
- Industry platforms
- Markets
- Crowdsourcing in Public Organisations
- Crowdfunding in Academic Research
- Digital Entrepreneurship and Home Life
- Venture Capital
- Nerd Entrepreneurs and Incubation
- Entrepreneurial Business Development
- Innovation of Organisation Relationships
- Internet of Things
- The Size of the Internet
- Internet Structure and Dynamics
- Social Computation and Cognitive Surplus
- The Technological Divide
- Incompleteness and the Digital/Material Divide
- Incomplete Information
- Representation of Users
- Data Science Innovation
- Skills for Data Science and Big Data
- Big Data and Customer Relationships
- Big Data in the Public Sector
- Big Data and Strategic Decision Making
- Error Friendliness
- Personalisation of Risk
- Security
- Surveillance
- Privacy and Technology
- Personal Data Protection
- Privacy Preserving Services
- Privacy and Technology
- Privacy
- Governance and Business Practices
- Space/Time Flexibility and Governance
- Regulation of the Payments System
- The Future of Mobile Payments

Cluster labels shown on the matrix:

- **Resilience in the Built Environment** (Orange)
- **New Business Models** (Purple)
- **Social Resilience and Entrepreneurship** (Yellow)
- **Big and Open Data** (Red)
- **Privacy, Trust, Security** (Blue)
- **DT+ Financial Services** (Green)

Clusters were generated using the Average Linkage Cluster Analysis algorithm.

Appendix C - Dendrogram

A dendrogram (a type of tree diagram useful for displaying hierarchical clustering data) of the similarity matrix data shown above is provided below.

It allows interested readers to examine how close (or distant) the average participant thought that groups of terms were from each other. The closer two topics on the left join, the more similar participants thought they were.
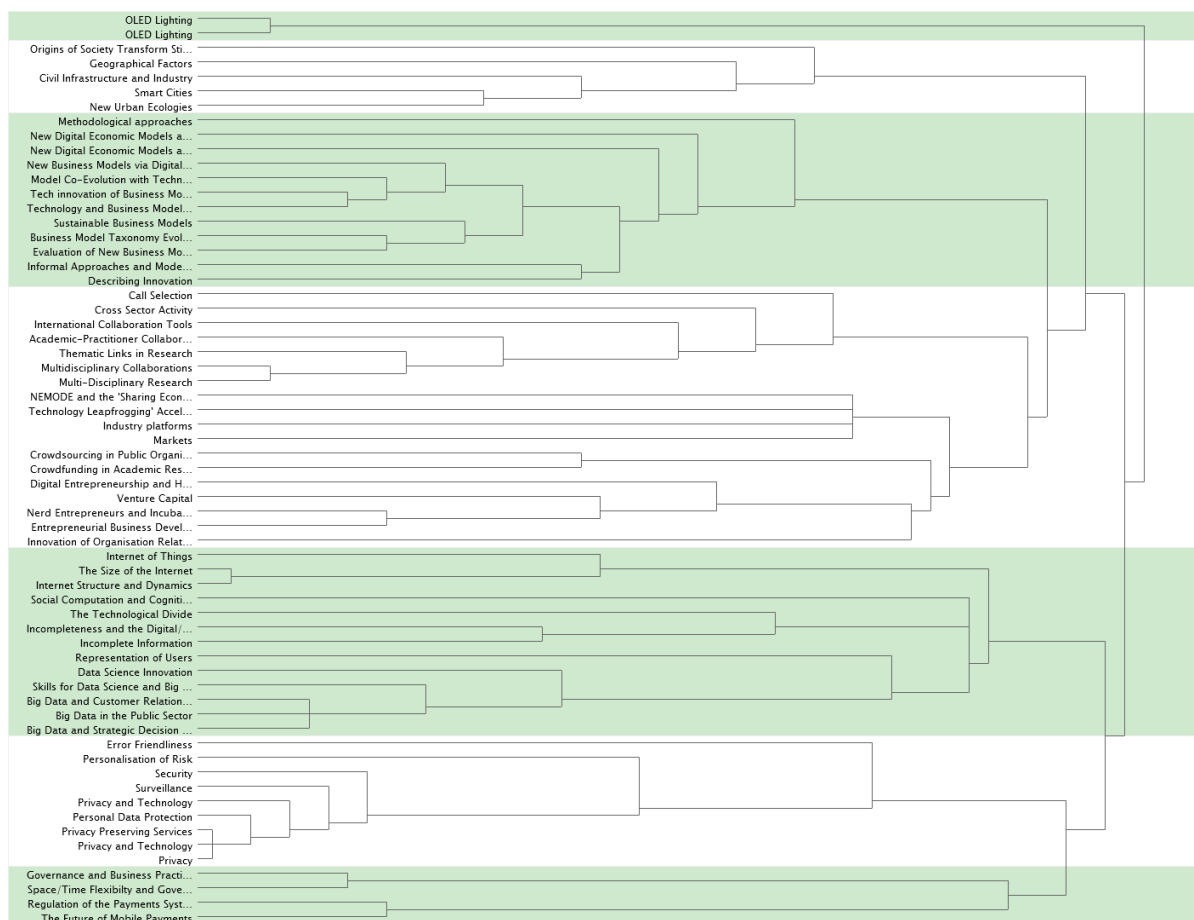
Please note: After the card sorting study was complete, it was discovered that OLED lighting had been erroneously submitted twice by the same participant, causing an outlier in the data. To ensure that all participants had an interesting group to participate in, it was decided to take seven clusters and merge OLED lighting into the group directly below it to create the desired six.

Appendix D - Process

In this section the process used to create the NEMODE research landscape is described. Below, we outline the main steps:

1. During registration every delegate was asked to provide two research topics they'd like to discuss at the meeting.

2. Each topic was given a short (< 50 character) description by the NEMODE investigators for use in the grouping study to come later.

3. These topics were all put into an online card grouping tool which allowed for dragging and dropping the topics into different groups.

4. Attending delegates were then circulated a link which asked them to group the submitted terms. Specifically the instructions stated that 'Each group used should contain items which are similar in your opinion. You can use as many or as few groups as you like.'

5. Five days before the meeting, the card sorting was closed and the results gathered.

6. At this stage, due to number of rooms and delegates likely to attend the second day, it was decided that we would aim to have six different groups which would be referenced initially by colours, Orange, Red, Purple, Green, Blue, and Yellow.

7. These cooperative card grouping results were then clustered using an Average Linkage Cluster Analysis algorithm to give the six groups desired.

8. On the first day of the meeting, delegates were asked to indicate which breakout session group they'd be interested in being a part of on the second day.

9. Due to the number of delegates wanting to discuss the Purple group, it was decided that there would be two Purple breakout groups.

10. On the second day, each group (Orange, Red, two Purple, Green, Blue, and Yellow) was provided with a picture of the topics in their area and a proforma asking for three research questions. They were given an hour to discuss and complete them.

11. Finally, these proformas were presented in a round-table feedback session immediately afterwards, before being included in this document and uploaded to http://www.researchperspectives.org/meetings/meetingJuly2013/

Appendix E - Meeting Pictures

Purple Group 1 - New Business Models

Yellow Group - Social Resilience and Entrepreneurship

Blue Group - Privacy, Trust, Security

Green Group - DT+ Financial Services

Red Group - Big and Open Data

Purple Group 2 - New Business Models

Appendix F - Meeting Agenda

Day 1-July 1

12:30 – 13:30	Registration and buffet lunch
13:30 – 13:40	Opening welcome and address.
	Professor R Maull
13:40 – 14:00	Building Better Business Models: Capturing the Transformative Potential of the Digital Economy.
	Professor C Baden-Fuller
14:00 – 14:20	Home Hub-of-all-Things (HAT) as Platform for Multi-sided Market powered by Internet-of-Things: Opportunities for New Economic & Business Model.
	Dr R Cliffe
14:20 – 14:40	Catalysing economic growth: releasing the value of big data.
	Dr A Leiponen
14:40 – 15:00	The wonders of the Zooniverse: Modelling and optimising volunteer participation in online citizen science.
	Dr J Cox
15:00 – 15:30	Coffee
15:30 – 15:50	Platforms.
	Dr A Gawer
15:50 – 16:10	Meaningful Consent in the Digital Economy.
	Professor M Schraefel
16:10 – 16:30	Bit by bit: Capturing the value from the digital fabrication revolution.
	Dr T Minshall
16:30 – 16:50	Big Data, Innovations and New Business Models.
	Dr T Preis
16:50 – 17:10	NEMOG: New Economic Models and Opportunities for digital Games.
	Professor P Cowling
17:10 – 17:30	Open session and questions
17:30 – 18:15	Keynote presentation
	Rachi Weerasinghe, Managing Partner, Advisory Services, Gartner

Day 2- July 2

09:00 – 09:10	Welcome and introduction to the day
09:10 – 09:50	Digital Business Ecosystems
	Jeremy Caine, IBM Executive Architect, Client Technical Advisor, Financial Services Sector
10:00 – 11:15	Significant themes for NEMODE research – Breakouts (incl coffee)
11:15 – 12:30	Significant themes for NEMODE research – Feedback
12:30 – 13:15	Future plans and funding opportunities
	Helen Thornham, Communities and Culture Network+
	Cathy Mulligan, Sustainable Society Network+
	Roger Maull, NEMODE