# Catapulting Britain into a Connected Digital Economy: Issues of the Scale and Scope of a New Centre

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A Summary of Discussion at an ESRC Seminar held at the Saïd Business School, Oxford University on 21 May 2012.[1]

## Preface

This report summarizes discussion at a seminar, entitled 'The Converged World of the Internet in a Connected Digital Economy: A Workshop to Focus Collaboration Across Business, Industry and Academia'. The workshop was designed to explore strategies for building the collaboration essential to support a Connected Digital Economy Catapult (CDEC), an initiative of the UK's Technology Strategy Board (TSB). The organizers saw the success of the proposed catapult to depend in part on business, industry, and university centers of excellence defining a clear conception of the converged world of the Internet, and related media, information and communication technologies, particularly with how it connects with the creative sectors of the digital economy. A key impetus of this workshop was the need to join thinking across different sectors of business, industry and academia.

The workshop brought about 30 participants together (see Appendix 1) at the Saïd Business School, Oxford University, on 21 May 2012 for intensive sessions over four hours. The participants included colleagues who had been participating in the Future Internet Strategy Group (UK FISG), convened with support from the TSB, leaders within similar initiatives around the creative industries in the UK, and those involved in a variety of digital economy research efforts supported by the UK Research Councils, as well as the EC's Horizon 2020 Framework Programme for Research and Innovation; Future Internet (FI) developments within the 2nd call of the FP7 ICT Future Internet PPP, and more. Bill Dutton provided a brief introduction, followed by a discussion of key issues raised by participants, moderated by Nick Wainwright from HP, Chair of the UK FISG. Immediately before a working lunch, Marc Ventresca introduced the Dean of SBS, Professor Peter Tufano, who offered brief remarks on the potential contributions for academic business schools in the Catapult and welcomed participants to the School. The afternoon began with a briefing session by TSB's Maurizio Pilu, who up-dated participants on the state of activities aimed at setting up the Catapult and opened up a lively Q&A session. His presentation was followed by discussion aimed at providing advice to TSB and the CDEC Team, which was again moderated by Nick Wainwright.

Participants shared a sense of the potential synergies linked to the convergence of the Internet and related media with the creative industries. Existing initiatives that could complement this effort included the evolving set of technology and innovation centers and programs and special interest groups organized by the TSB that are designed to promote the economic development of the UK, such as a special interest group on 'Internet of Things'. Integrating these various initiatives was seen as another challenge for the proposed catapult. Another challenge is to keep a focus in this development stage of strategic partnerships on the range of complementary platforms and capacities that will be required for the Catapult to reach its full potential.

This workshop was organized and hosted by the University of Oxford as one of a set of workshops in an ESRC Research Seminar Series on 'Digital Policy: Connectivity,

Creativity and Rights' at four universities.[2] It joined a small multi-disciplinary set of university researchers with associates from business and industry, such as within the Future Internet Strategy Group, various sectors of the creative industry, TSB, and RCUK Digital Economy projects. We have tried to capture key points provided by the participants in this brief summary, but welcome any comments or additions from participants in the discussion or those who read this report.

[2] http://idl.newport.ac.uk/digitalpolicy/

## Introduction

The UK's Technology Strategy Board (TSB) initiated a number of 'Catapults' – centres that are designed to support business and industry to become global leaders and innovators in ways that will have major commercial implications for the UK.[3] A key Catapult was defined around the 'connected digital economy', defined as the 'emerging area of Internet–driven convergence, where content, data, people, businesses and the physical world connect in new ways, to deliver radically new applications, services and experiences' (TSB 2012). The Connected Digital Economy Catapult (CDEC) was formed to address innovative Internet usage, including the 'Internet of Things', and digital media and content (see Box 1). The selection of the connected digital economy as a focus for a Catapult was influenced by an aim to achieve some early successes as well as long-term, sustainable investment, with one workshop participant referring to this Catapult as a 'technologically-enabled opportunity for a digital economy'.

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Box 1. Objectives of a Connected Digital Economy Catapult.

Key objectives of the catapult are to:

- create new and sustainable ways to create wealth from digital media and content, such as through improved business models and infrastructures;
- drive digital service provision in sectors newer to the Internet economy, such as through improving trust, privacy and security, payment systems, and service oriented platforms; and
- encourage new application and services based on linking the physical world and the Internet, such as around an Internet of Things (IoT).

*Adapted from Pilu (2012).

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A wide range of briefings, conferences and meetings were organized by the TSB to convey the objectives of the planned CDEC, receive feedback, and plan for its launch. These were accompanied by on-going consultation by TSB with business and industry.

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[3] The Catapults include centres for Satellite Applications, Future Cities, Offshore Renewable Energy, Cell Therapy, and Transport Systems. Information about the centres is available at: http://www.innovateuk.org/deliveringinnovation/catapults.ashx

This image is from one of the early briefing and consultation workshops, held at the Department of Business, Innovation, and Skills, 1 Victoria Street, London.



The CDEC has a creative rationale as well as a pragmatic basis in pulling together areas that had strong support but could not be supported as separate initiatives. It evolved from the combination of three earlier Technology and Innovation Centres which shaped the foci of the CDEC (Box 2).

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**Box 2. From Technology and Innovation Centres to the CDEC.**

The idea of a CDEC emerged from consultations around two Technology and Innovation Centres:

- Digital Media/Creative Industries, focusing on the new media and new technologies, which will ensure that the UK's historical strength in creative and media industries continue in new global markets.
- Future Internet Systems, focusing on the continued evolution of the Internet into a key engine of our future economy and society, including its extension into a world of connected objects, and the management and harnessing of the value of ever-increasing volumes of data.

The CDEC was not a simple combination of the two, but a new perspective on convergence being driven by the Internet, that arose from the consultations. This perspective challenged the former separation between the Internet and media implied by the earlier definition of the two TICs.

Sources: TSB (2011), Pilu (2012).

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As the outlines of the CDEC had begun to take shape, the Oxford workshop invited participants to identify key issue(s) concerning the proposed CDEC, and what this centre could best do to accomplish its vision (Box 3) and make the UK a focus for global innovation in the targeted areas. The forum was open to any issues raised by the invited participants, with the input of participants used to shape the agenda for the day. Given this process, this report seeks to provide constructive feedback to the team orchestrating the launch of the CDEC.

The following sections provide a summary of the key points raised at the workshop. We begin by noting areas in which there seemed to be broad consensus and then move to an identification of issues that emerged in the workshop discussion. We then conclude with a set of recommendations that were made at the workshop, and which seek to move from the issues identified to identify ways forward.

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Box 3. The Vision for a Connected Digital Economy Catapult.*

"We want the UK to be the first place in the world where companies choose to innovate, try out new ideas, and find ways to make money in the connected digital economy, whether this is in the market for media and information, in the digitisation of service industries, or by linking the digital environment to our physical world."

*Adapted from Pilu (2012).

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## General Areas of Agreement

Four general areas of agreement were apparent, recognizing that we have pulled together a group of people interested in this proposal. Perhaps their interest is founded on at least four critical areas of agreement:

### An Important Opportunity: On the Money

Investment in a Catapult at the intersections of the Internet and media/creative industries provides a major opportunity for the UK to progress developments that have major economic and social implications. The creative industries offer the UK an opportunity to play a more significant role in shaping the future of the Internet. For example, it is arguable that other nations occupy more strategic positions in the development of underlying technologies, such as the US with its centers of ICT innovation such as in Silicon Valley, and others have a far larger base of users, who will drive domestic Internet developments, such as in China and Russia. However, the creative industries are strong in the UK, and present one of the best opportunities to provide the UK with a strategic advantage in developing new platforms, products, and services. Likewise, while the creative industries are strong in the UK, they are faced with major challenges in adapting to the digital world, such as in developing sustainable business models and reaching more global markets. In such ways, the Internet and creative industries could complement one another in the UK context. The interaction of Internet and media industries in the UK, as captured by the CDEC (Box 1), should be advantageous for both converging sectors. As one participant put it: 'We are right on the money!"

### The Need for Multi-Sector, Multi-Disciplinary Input

Few participants contested the necessity for a centre to bring people together across different sectors of business and industry, but also different disciplines – from computer sciences to economics, Internet studies and the humanities – to address the range of issues tied to the connected digital economy (Box 4).

Box 4. Illustrative Issues Tied to a Connected Digital Economy.

- Identifying opportunities at the intersection of digital technologies and creative industries, particularly that will have commercial potential;
- Drawing from social and behavioural research that provides insights relevant to the (non)use of digital media, such as the Internet and related ICTs;
- Understanding the legal, regulatory, and policy issues of relevance to the ownership, use, and exploitation of digital products and services, such as trademarks, copyright, and open innovation;
- Bringing social, legal and ethical concerns that shape the use or governance of digital technologies, such as privacy, trust, surveillance, anonymity, and identity, further forward in the design process;
- Innovating in commercial and business models that will drive the viability and sustainability of new products and services;
- Creating incentives and a place for collaboration across computer science, Web science, engineering, and related technical research with social research in order to address key constraints, such as in interface design, trusted platforms, security, and privacy in Cloud computing contexts; and
- Focusing on data as a resource and computational and networking approaches to research that open up new opportunities, such as in data mining and analytics, linked data, data sharing, preservation, and archiving.

These issues are only illustrative of many areas identified that would require collaboration across traditional sectors and disciplines. The centre cannot pre-identify the exact areas of research, as they will emerge as priorities of the Catapult when its leadership is in place, but whatever the exact lines of research, a centre can provide a place and set of incentives for encouraging the collaboration necessary to address such concerns. In such ways, the centre could foster collaboration between business and industry with academia that would not otherwise be possible.

*Investment: Breaking the Chicken and Egg Problem*

There was general agreement that the planned Catapult had broken the proverbial chicken and egg problem of who invests first – business and industry or government and academia. In this case, government, through the TSB, will seed development of the Catapult. This will enable the centre to build a base that will be an incentive for additional support from business and industry and a foundation for generating research and development grants, such as through EU funding, to sustain and grow the centre's activities.

That said, a number of participants noted the funding required to go beyond support for the on going activities of the Catapult, would be far greater. The centre would need to address the need to obtain orders of magnitude greater investment in infrastructure and R&D issue in order to make the UK a world leader in the digital and creative industries. The Catapult must position itself as a catalyst that reduces risks in advanced technologies and applications in ways that encourage VC's and companies to enter these new markets.

*The Centrality of Defining the Right Focus and Scope for the Centre*

A theme that cut across the entire day was the need to find the right scope for the centre – one that realistically matched the scale of funding. If defined too broadly, the centre might not realize this opportunity to foster commercial activity. If too narrowly focused, it might fall short of expectations tied to funding of the centre. We join this issue below in discussing key issues arising from the forum.

## Issues

The forum elicited a shared a sense of the potential synergies linked to the convergence of the Internet and related media with the creative industries. Participants were uniformly optimistic or in search of more information. Few if any expressed serious doubts about the central thrust of the proposed Catapult. However, in the interest of ensuring that this initiative was successful, many raised issues for consideration by the leaders of this Catapult. The following issues were among the most salient issues raised at the forum.

*Scope: ICT and the Creative Industries as Strategically Focused or Too Disparate?*

Initial funding for the centre is expected to be large in relation to many academic research programmes, but small in relation to many technology initiatives in the digital world of Microsoft, Google, Facebook, and the like. Given limited funding in a rapidly developing technological sector, what can the centre do that will not otherwise be done, and that will put the UK in a global leadership position? While there was general agreement on this general common sense principle, there was not a consensus on the appropriate focus and therefore the best scope for the proposed centre.

On the one hand, there was excitement about the win-win potential of joining the Internet and creative industries. On the other hand, some were concerned that by combining the creative and Internet industries, the scope could become too broad. Others noted that the full scope of the proposed centre was far broader than this intersection of the creative and Internet industries, as it included the IoT, and generally any Internet services (Box 1 above). This led some to wonder if the purpose of the Catapult could be clarified, and the scope more focused in order to avoid the risk of creating too disparate or wide-ranging of a scope given the scale of support. As one participant put it: 'I think a clear definition of scope and clarity of purpose is essential, coupled with an entrepreneurial management team that have UK plc goals at the forefront of what they do on a day to day basis.'

*The Best Use Cases or Initial Targets*

One area that will define and be defined by the focus of the centre is the choice of specific use cases for early work. This surfaced a variety of perspectives on the concrete areas that initial effort should be focused (Box 5).

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Box 5. Illustrations of Different Foci for Initial Projects Raised at Forum.

Would it be focused on a commitment to creating:

- new digital content
- new platforms and multiplatform delivery
- open service-oriented architecture
- tools for exploiting big data resources
- the IoT
- media convergence
- mobile commerce
- satellite-based services, creating links with another Catapult
- new Internet services.

One attraction to the proposed Catapult is the range of areas that it brings together. But in the early days of its launch, there will be a need to pick winners – projects or people who can demonstrate the potential for the centre.

An unstated assumption was that this would be driven by the individuals and partners assembled to launch the centre as the range of choices is large but opinion widespread on the most promising cases. However, a number of participants noted that the choice of leadership at the centre will be critical, as these individuals need to represent and embody the vision of the centre, and become its champions.

*The Need for Creating New Platforms for Experimentation*

A number of persuasive cases were made for a centre creating a platform for experimentation. For example, John Varney of Maximum Clarity argued that the centre might create a platform as a service to those affiliated projects as a means to 'avoid up-front spending on hardware' which would allow many entrepreneurs an 'opportunity to test ideas without bearing directly large, but common, start up costs' (and thus avoid the need to waste valuable time looking for funding), noting examples of such an approach in the US. Others argued that the public Internet itself is the platform for experimentation, with the scale of users required to genuinely test new concepts.

*Focusing on Production or Utilization?*

There was some concern that the intersection of the Internet with creative industries would result in a focus on the production of new content or services, and ignore equally significant issues tied to the greater use of the digital technologies and services. As with telecommunications, there are strong arguments that the vitality of the digital economy will depend as much on its effective use by small and medium sized businesses (SMEs) and individuals as on the creation of new Internet or creative companies. For instance, the vitality of Britain's digital economy will depend on increasing the use of the Internet in ways that diminish existing divides between urban and rural users, the young and old, and those with greater and lesser financial resources. It is not simply a matter of creating new industries or businesses, but enabling existing businesses and individuals to take advantage of new ways to manage their everyday life and work more effectively – saving time, travel, and other resources.

*Shaping a Supportive Policy Context: Outside the Scope of a Catapult?*

Technical and business innovations are difficult to exploit in an uncertain or hostile policy and regulatory environment. A number of indicators suggest that the UK has provided a policy context that has been supportive of innovation in the creative and Internet industries. For instance, the UK ranks high among countries in terms of online shopping and e-commerce. However, some participants saw the Digital Economy Bill and efforts to curtail copyright infringement likely to have a chilling effect on Internet use if it were to lead to disproportionate surveillance of Internet users. Another concern was over the Data Communications Bill, if it were to usher in an era of online surveillance that would undermine the vitality of the digital economy and the success of any centre.

## Recommendations

Participation in the workshop was designed to facilitate open and candid discussion across business and industry and academia, not to be representative of any particular set of stakeholders. The recommendations that developed out of the discussion are therefore noted only as a way to stimulate and inform the thinking of the development team and others. We are confident that many of these issues have been considered and resolved, making some of these recommendations out of date or irrelevant, but we hope that some might provide a constructive input to the design of the proposed Catapult.

*The Users: Focus More on Scale-ups versus Startups*

Dean Peter Tufano emphasized the potential value of focusing attention on scaling-up innovative companies, rather than focusing most resources on initiating new start-ups. He drew this thesis from the relatively small proportion of high impact UK firms that were founded in recent decades and grew to scale, as compared to major companies in the US, for example.

This related to a broader question that some participants asked: Who are the users? This is part of the problem of defining a clear focus for the centre.

*Make Things Easier for SMEs and other Users*

Some participants saw a potential for the Catapult to be a place where SMEs could go for advice and support – a source of expertise. This would achieve a key mission of the Catapult vis-à-vis SMEs, and potentially become a source of revenue for the centre. However, others argued that this would not have a major impact, given there are tens of thousands of SMEs, while others that this would compete with other business and public initiatives, and would undermine their existing sources of support. This issue rose specifically in the area of offering support on security issues, in discussing the potential value of a security-testing lab for SMEs. This could provide a useful and revenue-generating service, but also compete with and undermine private sector offerings in this area.

*Locate the Centre within a Critical Mass of Creative and Internet Industries*

Examples were developed around Silicon Valley, areas of Israel, and other geographically focused areas of technological innovation nested with major universities to argue that the centre would be placed where there is the greatest critical mass of existing industries, services, and university centres of relevance to the Catapult. To some this meant locating in the Greater London Area if not in a more specific area, such as the London area of Shoreditch. Of course, there are a number of other competitive geographical clusters, including Manchester, with its digital city strategy, Pinewood Studios, with its cluster of film industries and services, Oxfordshire with its publishing and IT industries, and more. Others argued for a distributed centre or network that connects more specialized regional clusters.

*Focus on Collaboration for Technology Transfer versus Research and Development*

The Catapult could usefully focus on 'connecting the stovepipes' across the disconnected digital economy by supporting collaboration. It should not try to become an R&D centre, as universities and industries are focusing on these activities, but on technology and knowledge transfer, an area that the UK has not been noted for doing well. The focus on collaboration resonated with related calls for focusing on the near-term – two to three years out, rather than looking too far downstream, and place equal focus on business models and other enabling factors (as discussed below).

As a neutral place for bringing together potential actors in collaborative ways, the Catapult could build on its inherent 'convening power' as a well-funded and highly visible centre. One participant suggested the need for a 'Bob Geldof moment' that would even further raise the profile and convening power of the centre. As Nick Wainwright argued, the TSB and UK government have tremendous 'pulling power', which the centre can use to support collaboration, which should focus on bringing people together across sectors but also across different Catapults.

Despite general agreement on the need for collaboration across disciplines and sectors, there is an equal measure of realism about the difficulties surrounding such cross-sector collaboration. The creative and Internet industries, for example, are anchored in different cultures, ideologies, markets, and business models than the Internet industry? But all saw the potential for the Catapult to become a 'cross-roads of expertise and specializations'.

*Solving Problems versus Pursuing Technical Innovation as a Value in Itself*

There are many real world problems that could be a focus of Internet and related ICT innovations. Trying to push innovation of the Internet and related digital technologies might be furthered best by focusing on solving problems, such as getting signals into the London underground, better serving rural areas, creating new business models for music, or addressing problems with cellular infrastructure, such as by using 'white space' to support cell infrastructure in rural areas. A problem-focused centre might be more likely to succeed in the current economic and social context, which might be less amenable to supporting technical innovation as an end in itself, and also help distinguish the CDEC from academic institutions.

*Building an Agile Structure and Facility*

A few participants worried that the Catapult team might be building a structure that was over-engineered – too 'elaborate, expensive' and bureaucratic, rather than simple and 'agile'. As some put it, the team should focus more on the scope and focus of the centre and less on structure.

*Representation*

Several participants noted that the next generation – youth – and women should be well represented in any Catapult. It was noted that the forum disproportionately represented middle-aged and older men and under-represented youth and women, both representing critical segments of the new digital economy. While the forum was not publicized, two students at the business school discovered our seminar on the day, and joined the event effectively – both having experience in the area before returning to school for training in business and finance. The value added by such students and younger professional and technically trained entrepreneurs could be huge for the centre. Undoubtedly, the centre would not compromise the recruitment of world class participants as its major priority but be mindful of the value of a healthy balance within the centre across age and gender.

*New Business Models as Critical as New Technologies?*

Few question the value of technical innovations, such as those that have created the Internet, Web, new search engines and social media, but some emphasized the need to place as much emphasis on innovation in the business models supporting the creative industries and the Internet. Major companies failed to recognize that search had a business model, for example, which others have managed to build major companies around. This requires that a centre consider access to strong business, finance and economic expertise as well as technical.

*Join Debate over the Political, Social, and Policy Contexts*

Policy initiatives are in train that might derail efforts to grow our connected digital economy. For example, it is arguable that the new communications bill, copyright policy, initiatives around surveillance of Internet users, and more, could dramatically affect the vitality of the Internet in Britain for better or worse. Debate and research on these issues might fall beyond the remit of a CDEC, but their evolution will shape the context of a connected digital economy, and therefore need to be brought onboard. This could provide one of many roles for academic partners and universities.

## Conclusion

The Oxford seminar on the CDEC reinforced the value of the proposed Catapult. Interactions between the Internet and creative industries could provide a strategic approach for Britain in the global digital economy. There were many different opinions about the best projects and areas for the Catapult to undertake in its first years, but this was combined with an understanding that detailed decisions on these matters would be shaped by the vision and expertise brought in by the initial leadership of the centre. The key underlying theme was the virtue of this focus, along

with the challenge of finding the right scale and scope for the centre, since the connected digital economy is potentially so vast and far-reaching.

*Appendix 1. Workshop Participants*

CJ Adam, Oxford MBA Student
Andy Bower, BBC
Caroline Bucklow, Knowledge Exchange, University of Oxford
Chris Chambers, BBC
Andrew Chitty, Illumina Digital Ltd
Richard Davidson-Houston, Channel 4 Online
Prashant De, Oxford MBA Student
David de Roure, Oxford e-Research Centre
William Dutton, Oxford Internet Institute
John Farrington, University of Aberdeen
Nick Graham, Ebiquity
Philip Hargrave, ICT KTN
Tony Henderson, Microsoft
Graham Hitchen, directional thinking
Mike Hook, Roke Manor Research
Paul Jenkins, BT Innovate & Design
Daniel Klein, Detica
Lynne Murray, Holition
Maurizio Pilu, Technology Strategy Board
Sharon Pleydell-Pearce, Social Science Division, University of Oxford
Eddie Townsend, ICT KTN
Jonnie Turpie, Maverick Television
Colin Upstill, IT Innovation Centre
John Varney, Maximum Clarity Ltd
Marc Ventresca, Said Business School
Nick Wainwright, HP
Stuart Wilkinson, Knowledge Exchange, University of Oxford
Evelyn Wilson, The Culture Capital Exchange
Simon Yarwood, Institution of Engineering and Technology
Gillian Youngs, University of Wales, Newport

*Appendix 2. Collaboration with Academia*

The CDEC is designed to be industry-led, and not an academic research program. However, this still leaves open the ways in which academia can support and contribute to the work of the proposed CDEC. It was helpful to some participants to develop concrete and discrete examples as a means to illustrate possible forms of collaboration. The following table suggests the kinds of opportunities that are likely to come to a CDEC, with a real or fictitious example, and some ideas on what the role of the CDEC and a research unit might be.

| Type | Example(s) | Role of CDEC? | Role of Research? |
|---|---|---|---|
| Individuals with New Ideas | Two researchers with an idea for a new search engine; SME with a new way to encrypt files; … | Interview, incubate and develop demonstrator, or put in touch with others; support licensing, protection of IP; help start-up | Relevant training for start-ups; potential to draw from academic expertise |
| SME with new digital technique or product | Filmotography Studio; … | Help scale to next stage; push to think globally; share technical advances to their product | Provide sense of alternative business models; … |
| Hyper-local Digital production team | 3VTV; digital wiki heritage project; Voices from Oxford; … | Demonstrate leading-edge digital production; sharing of best practices, such as on copyright; create a type of YouTube Academy | Workshops to connect various projects; develop proposals; … |
| Major production company seeking to develop new online platforms | BBC iPlayer goes to multiple devices; Pinewood Studio to create a new VR Studio | Link with entrepreneurs at the CDEC; … | Possible sites for case studies, … |
| Non-ICT or media business seeking to move into an area | Utility company seeking to provide information services to consumers | Bring their team up to date on relevant developments in the UK; avoid reinventing, … | |
| Traditional Artisans wanting to go digital | Potters, who would like to show their work to others; … | Connecting with trusted Web design teams; training; provision of platform for commercial offerings | University libraries and archives working on 3-dimensional visualization |

| New SME w/o marketing ability | Technical advance that is not well developed for potential users, markets | Translation of technical development into an attractive product | Expertise in marketing; case studies of marketing challenges |
|---|---|---|---|
| Creative industry losing revenue | Music company seeing profits decline | Experiment and expose to new business models | Seminars, research opportunities, … |
| Information service with a new big data set they believe to be valuable | Water companies to provide alerts to families with seniors, based on smart metering; … | Help with ownership, licensing, issues over privacy, data protection | Opportunities for research on the impact of new services, consumer behaviour; … |

*Appendix 3. References*

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