

Submission to the Digital Britain Steering Group Secretariat

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Executive Summary

Delivering Digital Britain will require the co-ordination of supply and demand: supply of faster, universally accessible broadband networks, and creation of the valuable content and services that will make users demand them.

The government should act to facilitate this co-ordination:

- **On the supply side, by providing telecommunications companies with appropriate incentives, such a Spectrum for Speed swap, to speed up the delivery of next-generation networks, and ensure universal broadband access across the UK.**
- **On the demand side, by encouraging the private sector to develop new content and business models to reap the commercial opportunities created by digital technologies. The government should support this development by creating open access next-generation test-beds where the demand for novel applications and business models can be both 'probed' and 'proved', and through targeted funding. Demonstrating consumer appetite for enhanced broadband capacity should help reduce the perceived risks of investing in the deployment of next-generation networks.**
- **The government can also stimulate demand for broadband through the digital provision of public services in new, more efficient and inclusive ways. The government should provide incentives for innovation in the digital delivery of public services, and identify and raise the profile of those initiatives already in place.**

About NESTA

NESTA is the National Endowment for Science, Technology and the Arts. NESTA's mission is to transform the UK's capacity for innovation. We conduct research to build a body of evidence about how best to support, measure and improve UK innovation; we develop innovation programmes to encourage in the UK a culture that helps innovation to flourish; and we invest in early stage high tech companies.

NESTA welcomes the opportunity to submit evidence to the Digital Britain Steering Group Secretariat.

NESTA has a long-standing research interest on the impact of digital technologies on UK growth, creativity and innovation. We have published research on the growing importance of users as sources of innovation¹ and on the role that (Information and Communication Technology) ICT networks play in connecting UK regions to broader innovation networks.² We have explored innovation in business models and organisational forms by creative companies as one example of hidden innovation which is becoming more common in digital environments.³ We are currently carrying out research with the National Theatre and the Tate Gallery on the use of ICTs by cultural organisations in order to reach new audiences.

We have assessed and made policy recommendations to address the challenges faced by the UK video games sector.⁴ As part of our work-stream on 'Attacking the Recession', we have made the case that in order to come out of the current downturn sooner and more competitively, the UK should make a decisive investment in its broadband infrastructure⁵, and implement specific policies to support the activities of high-growth sectors where the UK has a competitive advantage, including digital content.⁶

Our Innovation Programmes have launched several initiatives aimed at harnessing the potential of digital technologies to enhance the ability to innovate of the UK's people, companies and public institutions:

- NESTA Connect deploys social media platforms to grow and support the activities of innovative networks.
- The Creative Economy Programme encourages creative sector companies to experiment with digital business models for content creation and distribution.
- The Public Services Innovation Lab provides a space for experimentation with innovative, more efficient and inclusive ways of delivering public services. This includes innovative provision of public services using digital technologies.

Introduction

1. The Digital Britain interim report published on January 2009 contains a comprehensive review of key issues that the government should address in order to guarantee that the UK remains at the forefront of the Digital Economy in the years to come.
2. In this submission NESTA focuses on two areas of the report: the supply of broadband capacity (including both next-generation networks and digital inclusion), and the supply of digital content and services which will make such networks valuable for their users. We highlight the need to create an

¹ NESTA (2008), 'The New Inventors: How users are changing the rules of innovation'. London: NESTA.

² Mahroum, S., Huggins, R., Clayton, N., Pain, K. and Taylor, P. (2008), 'Innovation by Adoption- Measuring and mapping absorptive capacity in UK nations and regions'. London: NESTA.

³ NESTA (2008), 'Hidden Innovation in the Creative Industries'. London: NESTA.

⁴ NESTA (2008), 'Level Up: Building a Stronger Games Sector'. London: NESTA.

⁵ NESTA (2008), 'Getting up to Speed' London: NESTA.

⁶ NESTA (2009), 'Demanding Growth'. London: NESTA.

environment that is supportive of market and public-led innovation to develop, test and diffuse future 'killer applications' that will drive the uptake of next generation broadband by UK households and companies.

3. The appendix contains case studies illustrating some of the challenges faced by UK digital content businesses, as well as innovative strategies to address them.

Coordinating supply and demand

1. NESTA believes that the goals set out in Digital Britain, that is, the creation of an ICT infrastructure that enables everyone in the UK to reap the economic and social benefits from new forms of content and service production, distribution and consumption will require the co-ordinated design and implementation of suitable policies on both the supply and the demand side.
2. Adopting a two-pronged approach is crucial because of the important interdependencies between access to networks and availability of content.⁷ Mass-market consumers are unlikely to pay for high quality content that can only be imperfectly accessed because of bandwidth constraints, or upgrade to high capacity networks lacking in attractive content and applications.
3. This creates a co-ordination problem in the deployment of next-generation platforms. A supply-based approach where telecommunications companies lay down fibre to create additional (and affordable) network capacity faces the risk of insufficient consumer demand for this additional capacity. And simultaneously, innovative content and service providers lack incentives to develop the applications that would justify that demand, precisely because these applications cannot be accessed conveniently at current broadband speeds. This is a classic example of an innovator's dilemma where doubts about the revenue generation potential of novel applications and services create inertia towards older and more established ways of doing things.⁸ Targeted government intervention can reduce this inertia, leading broadband providers to accelerate their investment plans in next generation infrastructure.

Supply of Network capacity

Speeding up the roll-out of next-generation broadband

4. NESTA welcomes the commitments already made by BT and Virgin Media to invest in next-generation broadband networks across the UK. NESTA believes, however, that the government should take a more active role in supporting the deployment of next-generation broadband than the 'wait and see' approach put forward in the interim Digital Britain report and the Caio report that preceded it.⁹

⁷ Katz, M. and Shapiro, C. (1996), 'Systems Competition and Network Effects'. *Journal of Economic Perspectives* 8 (2) 93-115.

⁸ Christensen, Clayton M. (2003), 'The innovator's dilemma : the revolutionary book that will change the way you do business', New York: HarperCollins

⁹ Caio, F. (2008), 'The Next Phase of Broadband UK: Action now for long term Competitiveness' available at <http://www.berr.gov.uk/files/file47788.pdf>

5. NESTA believes that this is an important way in which the government can 'attack' the current recession, speed up recovery and improve the UK's future competitiveness.¹⁰
6. Although there is a scarcity of data about the impact of an upgrade from current generation to next-generation networks¹¹, estimates based on South Korea's experience¹² suggest that they could be very considerable. The Broadband Stakeholders Group (BSG) has calculated that upgrading the current network infrastructure from copper to Fibre to the Cabinet (FTTC) would cost £5Bn. NESTA estimates that this initiative could potentially create 600,000 jobs and contribute £18 Bn to the economy over 4 years.
7. NESTA acknowledges the budgetary constraints faced by the government, so we call for the adoption of a 'Spectrum for Speed' approach to fund the deployment of next-generation broadband. This scheme would entail a swap of some of the spectrum rights to be freed up during the digital TV switchover in exchange for broadband providers' commitment to speed up the deployment of next-generation broadband across the country.
8. NESTA welcomes the acknowledgement of Community Broadband Networks as alternative and complement to the broadband deployment activities of private telecommunications companies. We believe that the public sector can play a similar role as a lever for private investment, particularly in areas whose geography or demography makes broadband deployment unattractive for commercial providers. North Yorkshire's NYNET initiative¹³ constitutes an example of the way in which public procurement can be used to build the backbone of a broadband infrastructure connecting public buildings (such as schools, libraries, hospitals and council buildings) in a rural area. This network can then be extended by private carriers in order to provide broadband access for households and businesses. NESTA believes that the Department of Innovation, Universities Schools, and local public sector bodies should encourage the formation of regional coalitions for the delivery of public and open broadband infrastructures following NYNET's template. However, and as the interim Digital Britain report indicates, it is also necessary to guarantee that these community and local networks are connected seamlessly through the adoption of common interoperability standards.

Achieving universal access

9. NESTA believes that the Spectrum for Speed swap outlined above should also be used to encourage telecommunications companies to go beyond the Universal Service Commitment put forward in the interim report, and provide affordable current generation broadband access to the 47% of UK people who remain 'disconnected'. This supply-side approach will however need to be complemented with demand-side policies to increase the online availability of compelling content and useful services.

¹⁰ Leadbeater, C. and Meadway, J. (2008), 'Attacking the Recession' London: NESTA, Meadway, J. and Mateos-Garcia, J. (2009), 'Getting up to Speed', London: NESTA

¹¹ D'Costa and Kelly (2008) 'Broadband as a platform for economic, social and cultural development: Lessons from Asia', Paris: OECD.

¹² Lee, H., Oh, S., and Shim, Y. (2005), 'Do we need broadband? Impacts of broadband in Korea', Info, Vol. 7 (4), 47-56.

¹³ <https://www.nynet.co.uk/about.php>

Supply of digital content and services

Probing and proving next-generation 'killer' applications, content and business models

10. A 'killer application' is a highly desirable computer program that increases the value of the platform where it is consumed.¹⁴ There are applications, content and services that increase the value of networks in a similar way - for example, email, online video and social networking platforms in the case of current broadband networks.
11. The interim Digital Britain report mentions BBC's iPlayer as an example of a popular application that has increased demand for next-generation networks. NESTA agrees that Public Service Broadcasters have an important role to play as providers and commissioners of innovative, high quality content and services that will encourage people across the UK to adopt or upgrade their broadband connections. However, this does not preclude policy actions to support the innovative activities of other private and public sector players with the capabilities to develop applications that will help in the take-off of next-generation networks.
12. The interim report establishes that there are Intellectual Property (IP) and piracy issues that need to be addressed in order to encourage the private sector to provide innovative applications, content and services online. However, NESTA believes that these issues are symptoms of a more general problem - the need to generate and test new business models that are better geared to online environments.
13. There are important commercial opportunities in digital convergence, user-generated content, viral marketing, targeted advertising and on-demand distribution.¹⁵ This is illustrated with the case studies in the Appendix - Revolver is an independent film distribution company that has adopted online marketing strategies to reach audiences across different channels, while Revolution Software is a video game company that uses digital distribution to engage directly with its customers and keep control over its Intellectual Property.
14. However, there is evidence suggesting that UK companies face barriers in accessing funding, which might limit their capability to explore these new business models, or scale them up into mass-market propositions.¹⁶ This risk of underinvestment in innovation, particularly severe in the current recessionary context, is a case of market failure that justifies public intervention through measures such as R&D Tax credits and support grants. The 'Technology Strategy Board's 'Accessing and Commercialising Content in a Digitally Networked World' competition is an example of a public scheme that provides funding to develop new technologies and ways of generating revenues in digital environments.
15. NESTA believes that making the most of the new opportunities that emerge in online environments will require content providers to

¹⁴ Shapiro, C. and Varian (1999): 'Information Rules: A Strategic Guide to the Network Economy', Cambridge, Mass: Harvard University Press.

¹⁵ IPTS (2007): 'Discussion Paper on the State of The Art of The European Creative Content Industry and Market & National/Industrial initiatives' and IPTS (2007): 'Discussion paper on Technology Trends in the Creative Content Sector', both available at <http://epis.jrc.ec.europa.eu/Pages/deliverables.html>

¹⁶ The Work Foundation (2007), 'Staying Ahead: The Economic Performance of the UK's Creative Industries', London: The Work Foundation.

understand better the potential emerging routes to market. To help achieve this goal, NESTA has set up the 'Digital Innovation in Film' program to promote partnerships between film businesses, digital media companies and distribution gateway owners.

16. Creative businesses need to engage more with each other and share technologies and expertise in order to develop the kind of multi-platform, convergent content solutions and services that consumers are increasingly demanding.¹⁷
17. There is a role for government in providing targeted funding to support the innovative activities of private sector companies as they experiment and collaborate with each other in the development of new online services and business models.
18. There is uncertainty about consumer demand in next-generation networks where greatly enhanced broadband capacity might make it possible to develop wholly new ways of delivering digital content. Identifying emerging demand trends, particularly in next-generation broadband environments, will inform the innovative efforts of the private sector, and give infrastructure providers valuable insights into the latent demand for upgrades in broadband capacity.
19. In order to achieve this goal, the government should fund open trials with next-generation broadband networks similar to South Korea's KOREN tests¹⁸, or those undertaken by BT in Muswell Hill in London.¹⁹ This entails the deployment of a next-generation network in a circumscribed geographical area, and an analysis of the usage patterns of additional broadband capacity by the population. This initiative will provide application and content providers with a test-bed to gauge customer demand for innovative ways of providing digital content and services. In order to maximise the innovative outcomes from this trial, access to the test-bed should be as open as possible. If necessary, smaller participants could be supported through competitions analogous to the TSB-sponsored 'Accessing and Commercialising Content in a Digitally Networked World'.²⁰ Unlike the trials already being conducted by broadband providers, the learnings from these trials will be publicly available to all broadband providers and content and service developers alike.
20. In addition to this 'probing' function, this next-generation test-bed should support innovation diffusion by 'proving' promising applications and services that already exist. Their 'real-time' deployment in next-generation environments will help build a public constituency for them, demonstrate their growth potential to investors, and the existence of demand for high capacity broadband to infrastructure providers.

¹⁷ Sapsed, J., Mateos-Garcia, J., Adams, R., and Neely, A. (2008), 'ESRC Business Engagement Project: A scoping study of contemporary and future challenges in the UK creative industries' available at

<http://www.aimresearch.org/uploads/File/pdf/Projects/Creative%20Industries%20Full%20Report.pdf>

¹⁸ IFIT (2008): 'Explaining International Broadband Leadership. Country Profile: South Korea' available at <http://www.itif.org/files/2008BBAppendixF.pdf>

¹⁹ <http://www.broadband-finder.co.uk/blog/2008/10/14/bt-to-trial-40mb-broadband/>

²⁰ http://www.innovateuk.org/_assets/pdf/competition-documents/accessing%20and%20commercialising%20content%20in%20a%20digitally%20networked%20world_071008.pdf

Digital provision of public services

21. The successful deployment of next-generation networks in South Korea demonstrates the crucial role for government support on both the supply- and demand-side.²¹
22. On the demand-side, this includes an important role in stimulating demand for broadband through the digital delivery of public services. The UK is facing important social challenges such as ageing, climate change and rising joblessness that will have to be tackled with reduced budgets.²² Digital technologies can help deliver public services to address these challenges in new, more efficient and inclusive ways. For example, online doctor consultations will improve older people's access to health services²³, while social networking tools can be deployed to help job-seekers.
23. Although NESTA welcomes the commitment to design public services for ease of use by the widest range of citizens, it also recognises that achieving this goal poses significant challenges. There are several reasons for this, including the need to balance the aspirations and demands of diverse constituencies, and to provide incentives to stimulate innovation by non-profit driven actors.²⁴ The seriousness of these challenges is underscored by the failure of large scale public IT projects developed from the top-down without a sufficient understanding of the needs of the public sector employees who actually do the job and the users who depend on the services.²⁵
24. NESTA recognises the need to support experimentation with innovative ways of providing public services digitally, and to raise the public profile of existing initiatives that show promise. In order to succeed, these support measures need to be designed taking into account the aforementioned specificities of public sector and social innovation. They must also recognise the ultimate need to provide universal provision of public services.
25. Regarding the first 'probing' function, NESTA's Big Green Challenge is a good example of an initiative that has leveraged the innovative potential and expertise of communities, charities and social enterprises across the UK in order to come up with novel solutions to mitigating climate change. Following its example, the government should set up competitions and 'Challenge Funds' open to participation from users with the goal of incentivising innovation in the digital delivery of public services. The outputs of these funds should, once again, be piloted in next-generation test-beds in order to assess their feasibility and value.
26. It is also necessary to 'prove' the value of existing initiatives for the digital delivery of public services. This will entail identifying and raising the profile of initiatives which are already in place, extracting lessons from their application and thinking hard about how they might be deployed through

²¹ Choudrie, J., Papazafeiropoulou, A. and Lee, H. (2003), 'Applying stakeholder theory to analyse the diffusion of broadband in South Korea: the importance of the government's role', Proceedings of the 11th European Conference on Information Systems, ECIS 2003, Naples, Italy 16-21 June 2003

²² Harris and Albury (2009): 'The Innovation Imperative', London: NESTA.

²³ OECD (2008): 'OECD (2008) 'Broadband Growth and Policy in OECD Countries'', Paris: OECD.

²⁴ NESTA (2007): 'Innovation in Response to Social Challenges', London: NESTA

²⁵ Harris and Albury (2009): 'The Innovation Imperative', London: NESTA.

next-generation networks. NESTA's Public Services Innovation Lab might have an important role to play in this process.

Appendix 1: Case studies

Revolver

Revolver is an independent UK film distributor with a reputation for marketing innovation. It has an eclectic and broad range of movies, for release on all platforms and has been exploring new business models to ensure that it can distribute its films through all emerging platforms.

The company has recently been experimenting with different release windows. At the end of 2008, it controversially released the feature film *Mum and Dad* simultaneously in cinemas, on DVD and via video on demand. Whilst the film had to compete with other movies for theatrical release space, the marketing of the movie focussed on every platform, allowing for the first time the decision on how to consume the film to lie with the audience.

Collapsing traditional windows for movie distribution is potentially disruptive. Exhibitors want to keep a clear window of their own to encourage audiences to attend their cinemas. However, by releasing on different platforms at the same time as promoting the film to cinema-goers, Revolver has made best use of a limited marketing budget. This strategy has allowed a micro budget movie made for approximately £100,000 to be more profitable.

Another way Revolver is experimenting with marketing is by getting its audience base involved in the early stages of the film-making process. *Freestyle* is a teenage love story set around the world of basketball with production a budget of £100,000. The target market is young teens and Revolver has teamed up with Bebo and the NBA to set up an audition process to find people from the UK to star in the film. They have had 20,000 unique users visit the website before the casting was announced. When the time comes for the film to be released, they hope to have developed a ready-made fan base which will then play a key part in marketing the movie to teenage audiences.

Revolution Software

Revolution Software is a video games developer based in York. Over two decades it has developed a number of highly successful adventure games for a range of different gaming platforms. The company's best known franchise, Broken Sword, sells up to a million units per version.

Twenty five years ago, the nascent video games industry in the UK flourished with innovators exploiting opportunities in the emerging market. Over time, as the cost of developing for ever more complex console systems increased, well-funded global media companies began to consolidate value across the supply chain. The status quo today is a development environment where games publishers normally buy outright any intellectual property developed by SME developers.

When video console games are sold via traditional retail outlets the developer is normally paid 10% of gross revenues against the development costs (retail and distribution taking 50% of the gross revenues, publishers take 80% of the remaining net revenues). Since development costs represent a considerably higher percentage of the cost of getting a game to market, developers rarely "earn out" additional profits. This creates a sustainability problem for games developers and results in a negative cycle of games developers undertaking "work for hire" (production work without any share of profits), in order to stay afloat.

Crucially, Revolution has steadfastly retained ownership of the intellectual property (IP) in the games it has developed. Because of this, the business has been able to strike more strategic and valuable deals with publishers. In addition, the business has the incentives and capability to nimbly exploit its IP across a much wider range of platforms.

Digital distribution is disrupting the status quo. As the owner of the IP, Revolution's approach has been to license new titles to traditional publishers on formats that require retail distribution, but retaining rights on formats on which digital distribution allows the company to sell directly to consumers.

While retail still accounts for the majority of sales, digital distribution earns a much higher percentage return – portals such as Microsoft's Xbox Live Arcade, and Apple's App Store for iPhones, pay the games developer up to 70% of revenues.

Having greater control over distribution platforms also allows Revolution to engage more directly with its audiences. Revolution markets new game releases through existing fan bases, as well as social networking sites like Facebook and Twitter.

Digital content businesses should be incentivised to develop, retain and exploit their own intellectual property across a diverse range of platforms. This is the most sure-fire way of enabling talented content businesses to grow and be sustainable. Retaining IP takes courage and is initially more expensive for the creative business. However, an entrepreneurial high risk/high reward culture must be fostered if we are to develop a successful Digital Britain.