

Jisc's response to the consultation on Digital Communication Infrastructure

29 September 2014

Introduction

1. This is Jisc's response to the Government's consultation on a digital communications infrastructure strategy.
2. Jisc, offers digital services and solutions for UK education and research. The charity does this to achieve its vision for the UK to be the most digitally advanced nation in the world. Working together across higher education, further education and the skills sectors, Jisc provides trusted advice and support, reduces sector costs across shared network, digital content, IT services and procurement negotiations, ensuring the sector stays ahead of the game with research and development for the future.
3. This shared infrastructure, based upon the Janet network¹, is entirely committed to the benefit of UK education and research. Through Jisc, the UK has one of the most successful 'shared services' ever – contributing annual cost savings alone in excess of £200 million, with every university seeing a direct financial benefit. For a typical research-intensive university this direct benefit is around £2.5 million, but institutions also gain advantage through the top-class digital facilities and resources that all UK researchers, lecturers and students access and derive value from each day.
4. Jisc negotiates with multinational corporations such as Microsoft, Amazon and global publishers on the sector's behalf; and has a world-leading horizon-scanning and trend-monitoring function to identify and explore new opportunities and new technologies. It then works to support universities and colleges in applying those technologies on the ground. Jisc also represents and acts for the UK internationally, which is increasingly important given that the infrastructure that research and education depends on is not restricted to the UK.
5. The Janet network provided by Jisc is designed and built to deliver advanced network services, enabling the UK education and research sector to compete on the global stage. The network removes the barriers of time and distance, through a provisioning strategy designed to ensure the variable needs of our customers can always be accommodated, and bringing additional value, capacity and potential to the wider education and research sector. September 2014 saw the launch of the **Jisc Shared Data Centre**,² which immediately benefits medical research but longer term will benefit universities and colleges across the UK.
6. For further information about Jisc, the breadth of our work and examples relevant to this consultation, please refer to Annex a.
7. Jisc would welcome further discussion about these points. Please contact m.harrows@jisc.ac.uk / 0203 697 5837 / One Castle Park, Tower Hill, Bristol, BS2 0JA

1 Cited in the consultation paper as *"The Janet network is a high bandwidth network linking high performance computing systems and connecting the UK's research and educational institutions and increasingly private sector research facilities working with such institutions."* (Red. Para 1.19)

2 For further details please see <http://www.jisc.ac.uk/blog/shared-data-centre-offers-rich-benefits-for-research-led-institutions-10-sep-2014>

Jisc's responses to the consultation themes

Role of government

8. Government rightly plays a leverage role in the delivery of a digital communications infrastructure strategy. If we consider today's infrastructure, which is predominantly privately-funded, it is clear that a purely laissez-faire approach cannot necessarily be relied upon to produce an underlying infrastructure that is fit for purpose.
9. Jisc believes there is a need for the Government to recognise how the domestic / consumer digital communications infrastructure interplays with the needs of particular sectors and industries, provisioned by private networks such as Janet, and how expectations of the quality of service are created by these experiences.
10. Jisc believes that Government could provide access to central purchasing frameworks for organisations engaged in delivering services to under-served areas. Such frameworks, effectively applied and monitored, could act as market leverage, generate better value for purchasers, and potentially provide top-slicing on a national scale.
11. We believe that Government could mandate the items to be included within the service level agreements between content providers and infrastructure providers, encouraging the de-monopolisation of the digital communications infrastructure market.
12. There is a role for Government in facilitating and encouraging investment in a digital communications infrastructure. We believe that best value for any Government investment would be achieved by targeting this towards ubiquitous coverage, with 'early mover' targets being directed at specific technologies. Government could also assist potential investors in gaining a better understanding how digital communications infrastructure could offer them a suitable risk and reward profile.

What might future demand look like?

Existing and planned communications infrastructure and the current infrastructure market

13. It is Jisc's view that the strategy needs to take the needs of all industries, sectors and communities into full account. This consultation is focused on the consumer market's access to media and content and the needs of small and medium enterprises (SMEs) as a homogeneous group. In doing so, it does not fully take into account the needs of other industries and sectors; including, the research, innovation, and education sectors.
14. The strategy needs to recognise the role and value of private networks, and how they interplay with a consumer market model. Next generation access services providing download bandwidths up to around 100Mbps may be sufficient for smaller teaching and learning institutions, but larger institutions will increasingly require symmetric (i.e. same upload and download speeds) connectivity in the order of 1Gbps and above, with the requirements of universities and other research institutions and being much higher

again. The specialist capacity, authentication and security required by facilities such as the Diamond Light Research Centre can only be provisioned through a specialised, private network as they significantly exceed what can be cost-effectively delivered via the commercial telecommunications marketplace.

15. Jisc recommends that the focus of the strategy is the provision of ubiquitous, 100% coverage, high-capacity infrastructure; with every user across the country enjoying a similar experience of the services being made available. Such extensive provision is the key to enabling change, growth and development, minimising challenges of regional exclusion and facilitating an increase in earning power nationwide. We recognise that such an aspiration may be considered financially difficult, and that the market has failed to deliver service levels to business and consumer markets, including those who believe that they have contracted for such service levels. We therefore feel that it is important that it is a target that Government supports and remains committed to, and that competitive markets, taxation and leveraged centralised funding be utilised to deliver this.
16. One model that Government should seek to make a feature of the strategy is an extension of **Super-Connected Cities**³ programme, incorporating, as an implicit component, piloting of a UK initiative similar to **Google Fiber** initiative⁴. As the US pilot of this initiative demonstrates, such an approach would improve technological skills, demonstrate commercial investment and confidence in the UK economy and facilitate a model of cities or regions taking responsibility for the digital infrastructure needs of their citizens.
17. To facilitate the digital communications infrastructure supporting the enterprising use of data to generate economic growth, it will need a security and access management capability. Existing “walled garden” and/or high-overhead compliance regimes are too expensive to scale to SMEs and others, and so shared data centre and cloud models which can provide sufficient and appropriate security and access management are required. Once provided, as an integral part of the digital communications infrastructure strategy, then delivery of higher-assurance public services across the Internet could also be facilitated.

The nature and influences on demand

18. Jisc considers that consumers already consider coverage and connectivity as “hygiene factors”, i.e. taken for granted, (para 3.36) but with the recognition that their expectations will not be met.
19. Jisc recommends that the strategy recognises the influence of benefit from private, high capacity, networks upon consumer expectations. The network provision to education and research is where, students, researchers and employees develop expectations of network provision in the learning and research environment, which they will expect...“to be matched through the consumer market in their home or public space. This was recognised in the Ofcom Communications Market Report, 2014⁵.
20. Government must assume the demand for digital communication will keep increasing. It should be recognised that demand for digital communication may be instigated from existing social and environmental factors or may be triggered by a realisation of the potential value of digitally based and powered operations and services. The provision of a high capacity, ubiquitous digital communications infrastructure has the

³ <https://www.gov.uk/government/news/ten-super-connected-cities-announced>

⁴ For further information, see <https://fiber.google.com/about2/>

⁵ <http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr14/>

potential to become the disruptive, enabling technology, to be both the cause and the effect both of economic growth and social development.

Competition and regulation

21. Jisc foresees that most competition will be in the consumer entertainment market.
22. The strategy should recognise the vast amounts of capital that are required to build a network, and utilise tactics and incentives that alleviate this pressure, for example modifying the spectrum auction approach. A revised Universal Service Obligation (USO) / Universal Service Commitment (USC) could take the form of a uniform price for a basic wired / wireless broadband service delivered anywhere in the UK.
23. Further measures are necessary to incentivise the rollout of mobile infrastructure in currently under-served areas. Coverage of 100% should be a mandatory requirement for all licenses, renewals and proposals.

Facilitating investment

24. The fixed-line market is becoming over-dominated by just a few players, due to consolidations in the telco industry, and less competitive as a result. There is a role for Government to be more aggressive in opening up the market.
25. Content providers need to be encouraged to play their part in investing in the digital communications infrastructure. Their involvement and investment should be used to encourage the de-monopolisation of the current digital communications infrastructure provision, and such an expectation and relationship could be established through their service level agreements with infrastructure providers.
26. Government support is needed to better articulate how the digital communications infrastructure could offer a suitable risk and reward profile for investors. Clearer understanding of its economic potential would encourage greater investment from the private sector. This should be underpinned by a review of taxation measures for communications infrastructure providers, shifting taxation from the producer to the consumer (of advanced services).

Annex A

Jisc provides more than 600 universities and colleges across the higher and further education sectors with:

- » Network and IT services – including access to one of the UK’s fastest internet connections; computer security protection; and ubiquitous Wi-Fi access for academics, researchers, students and staff through the eduroam network service.
- » Digital resources – including a licensing consortium through which institutions procure the vast majority of the electronic journals and other information resources used for research and teaching. It also provides shared services to support libraries and institutional repositories, resource discovery tools, and access to digital archives, geospatial data, multimedia and open educational resources.
- » Advisory services – supporting universities to get the most out of using technology for teaching, research and administration, along with advising the sector on how to respond to new challenges and opportunities.
- » Selective innovation and experimentation into how fast-changing digital capabilities can be harnessed by higher education institutions and the sector for new advantage.

Jisc not only provides solutions to the challenges faced by higher and further education's library and IT communities, but its services are also firmly embedded into most students' and academics' daily lives.

Big data and research data management

Already recognised as one of the government's "Eight Great Technologies", big data (the ability to access and analyse huge new datasets) will facilitate major breakthroughs in research across a whole range of disciplines, from healthcare and the physical sciences to applied social sciences and public policy. However, innovations in data-driven research will cause significant practical challenges for universities.

Through its Research Data Management Programme, Jisc is working with universities to develop practical solutions on how the huge datasets being generated by research groups can be stored and made available for wider analysis, use and validation. If all institutions were to create their own solutions not only would we be likely to lose value from shared standards and protocols, but we will also waste money on siloed infrastructural investments. In the longer term, success in this area will mean public funding is not wasted on recreating data that has already been produced, and that data created through research is used to its full potential.

Connectivity to the Janet network is also crucial to many big data projects. The European Bioinformatics Institute, part of the Wellcome Trust Genome Campus in Cambridgeshire, uses the network to share the petabytes of data generated through its genome sequencing analysis with researchers and collaborators around the world. Jisc's role in connecting these partners is key to enabling the discovery of new drugs and new diagnostics. The network is playing a similarly vital role in enabling the UK's position of leadership in space exploration, allowing high-resolution imagery to be sent between the UK's space hub at Jodrell Bank and observatories around the world.

Open Access

Since publication of the Finch Report in 2012⁶, the vast majority of significant research funders in the UK have mandated researchers to make their research outputs available openly.¹ These mandates vary in their implications for institutions, meaning that good working models are only slowly emerging. Jisc has been providing institutions with information on policies and their implications as well as working with funders and publishers to simplify the policy environment.

Crucially, Jisc has also been developing new negotiating frameworks on behalf of the sector to ensure UK universities keep the costs of complying with the mandates under control, as well as developing shared services that will count article usage, help institutions keep track of their research outputs and make open access research easier to find and use.

⁶ J Finch et al, *Accessibility, sustainability, excellence: how to expand access to research publications - Report of the Working Group on Expanding Access to Published Research Findings*, 2012.